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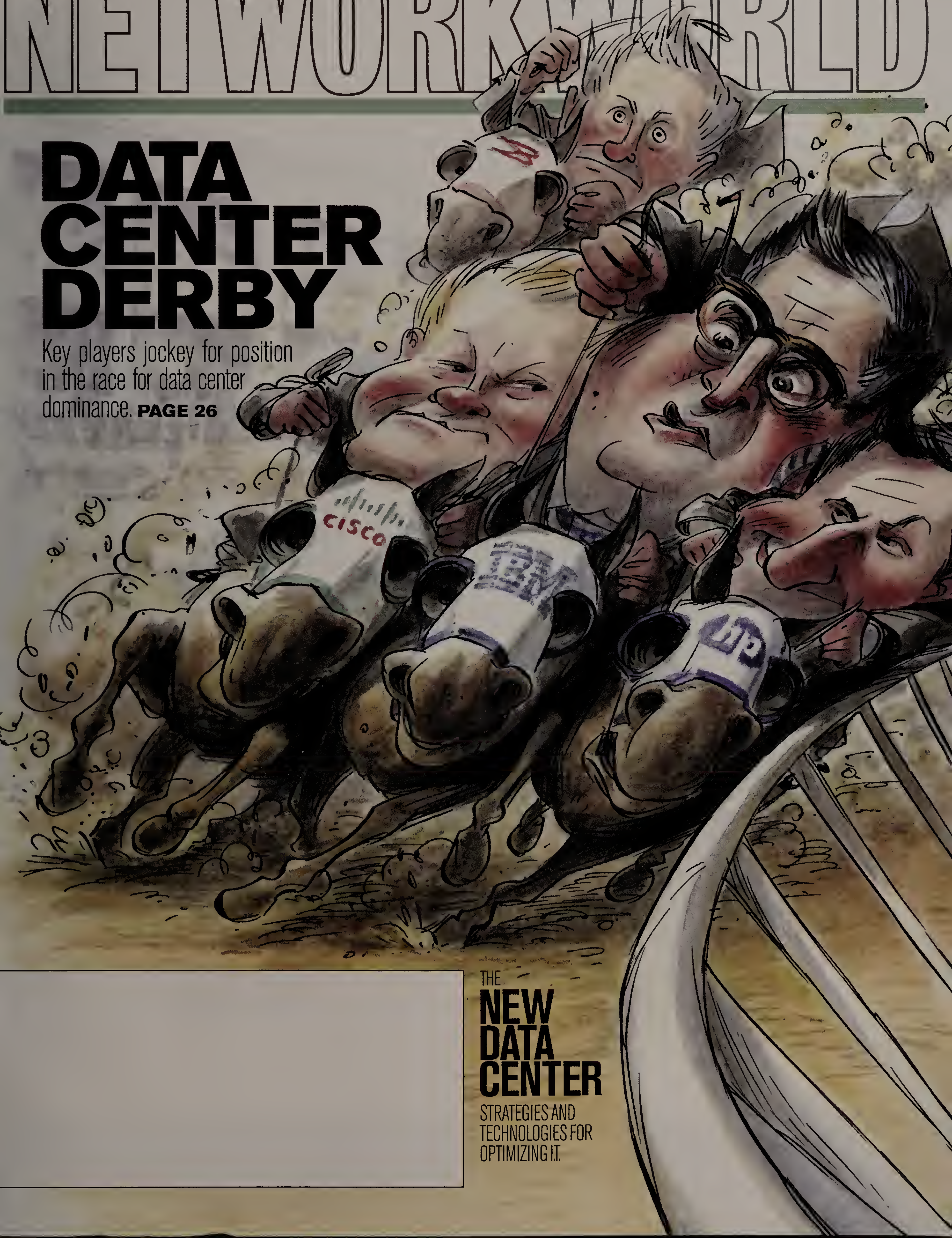

DATA CENTER DERBY

Key players jockey for position in the race for data center dominance. **PAGE 26**

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TIRED OF THE SAME OLD NETWORK RUNAROUND?

IT shops borrow money, lease more

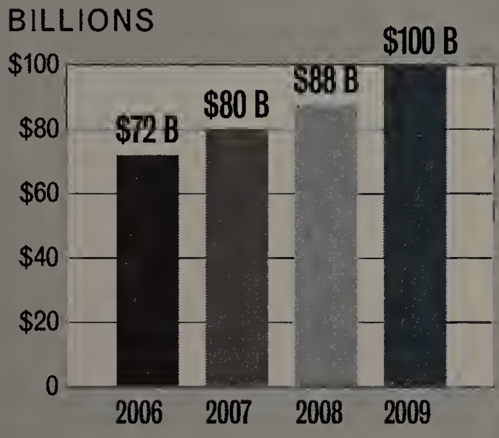
IT financing and leasing set to exceed $100 billion in ’09

BY JON BRODKIN

IT financing on the rise

With the economy in turmoil, more IT shops are financing and leasing new equipment to avoid big up front expenses. Financing and leasing of software and services is growing about 20% a year, while hardware financing is growing at a 4% rate.

Total worldwide market for IT financing and leasing over the past four years



SOURCE: IDC

IT shops are seeking loans and lease agreements in rapidly increasing numbers as they struggle through the recession. The worldwide market for IT financing and leasing is set to exceed $100 billion in calendar year 2009.

Last year, $88 billion of IT hardware, software and services was financed or leased, compared with $80 billion in 2007 and $72 billion in 2006, according to IDC.

“There is an uptick in IT leasing and financing practices. Companies are considering it because of the constraints around capital investments,” says IDC analyst Joseph Pucciarelli. “You’re looking at a year-over-year growth rate that exceeds 10%.”

Financing and leasing of software and services is growing about 20% a year, while hardware financing is growing at a slower rate of 4%, IDC analyst Susan Middleton says.

Besides the short-term benefit of delaying purchase costs, companies are also responding to new tax benefits provided by the federal government. Pucciarelli said the Economic Stimulus Act of 2008 offered new levels of tax incentives for purchasing IT equipment and software.

IDC and vendors with large financing arms such as IBM, HP and Dell expect that demand will continue to increase this year. IBM is getting ready by pledging $2 billion of financing money for technology projects related to the American Recovery and Reinvestment Act of 2009, saying the money will go to healthcare organizations, energy providers, enterprises and municipalities.

“Every CFO or treasurer I meet is re-looking at their capital structure and how they use cash,” says Richard Dicks, the general manager of IBM’s Global Financing team in North America. “They’re looking for other ways to acquire IT assets.”

Customers that were already financing and leasing IT purchases are turning to that option more often, and customers that previously avoided borrowing have concluded that financing is now necessary.

CFO Bill Shea of 1-800-Flowers says his company obtained a three-year lease from IBM to purchase WebSphere software, which the New York company uses to revamp Web sites devoted to its various food brands.

“With cash flow being lower than in prior years, to keep a little more powder in the gun we did use financing,” Shea says. “It has not historically been a vehicle that we’ve used [for IT purchases] but we did use it this past year with the economic downturn.”

Shea says 1-800-Flowers borrowed about $3 million on an unsecured lease line with about a 5% interest rate. Although it is technically a lease agreement, 1-800-Flowers will own the software at the end of the three years. That’s a good deal, he says, but Shea would rather not have to resort to financing in the future.

“A lot of it depends on how the economy changes,” Shea says. “Does the consumer come back and buy with the vigor they were back in 2007 and 2008? All things being equal, we would just use our cash flow to fund our capital needs, as we did for many years, and use financing for acquisitions and working capital purposes.”

Many companies are finding it harder to borrow from banks to fund acquisitions and other general business purposes, but they can still get financing from the lending arms of IT vendors, Dicks notes.

Just like banks, IT vendors are selective about who they lend to. If your company’s credit is bad, prepare to pay a higher interest rate. But IBM, HP and Dell all report that they are approving more financing and leasing dollars this year than last.

That’s significant considering the depths to which IT purchasing has sunk. Global IT spending is expected to decline nearly 4% in 2009. The server market which HP, IBM and Dell rely upon for much of their revenue is free-falling, for example, with sales dropping faster than they did during the dot-com crash. IBM, HP and Dell all suffered server revenue declines of 20% or more in the first quarter of 2009.

But for all types of products, HP did $1.2 billion worth of financing and leasing in the three-month period ending April 30, compared with $1.1 billion the previous year.

“In 2008 we grew the business at a double-digit rate across the board, in volume, revenue and profitability,” says Irv Rothman, president and CEO of HP Financial Services. “Thus far in 2009 we’re growing the business at a slightly slower rate. But we are growing the business, so that’s good.”

Dell Financial Services says its penetration rates (the percentage of overall sales attributed to financing and leasing) have risen 10% to 20% depending on the segment.

Across small businesses, large enterprises and public agencies, “we’re seeing a lot of stress with regard to trying to manage their capital expenditure budgets and at the same time maintain a competitive, up-to-date IT infrastructure,” says Larry Graves, a vice president and general manager with Dell Financial Services. “We’ve seen it with some very large Fortune 500 companies who have always purchased equipment, and are now starting to look at financing as an option.”

IBM Global Financing says it is still the largest IT financier in the world, with 3,000 employees, $36 billion in assets and 125,000 customers. In North America, 42% of all IBM hardware purchases are financed, but demand for financing software and services is growing faster as the price of hardware declines, Dicks says.

“Software and services are becoming a bigger part of the portfolio,” he says. “We’re having more conversations with clients.... These aren’t people getting ready to go bankrupt. These are strong players, with strong credit who want to grow their businesses.”

Obviously, vendors want to steer customers toward their own equipment. But they aren’t opposed to financing the purchase of rival

See IT financing, page 13

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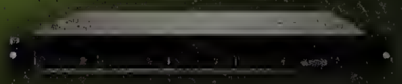

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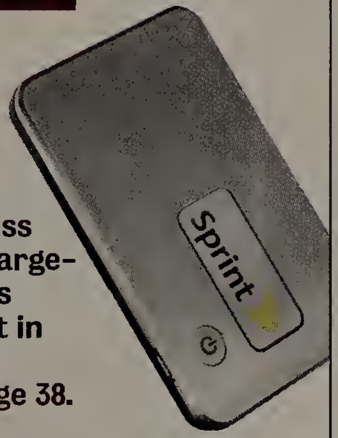

■ **The Sprint Mi-Fi 2200 mobile wireless router has a rechargeable battery and is small enough to fit in your shirt pocket. See Cool Tools, page 38.**

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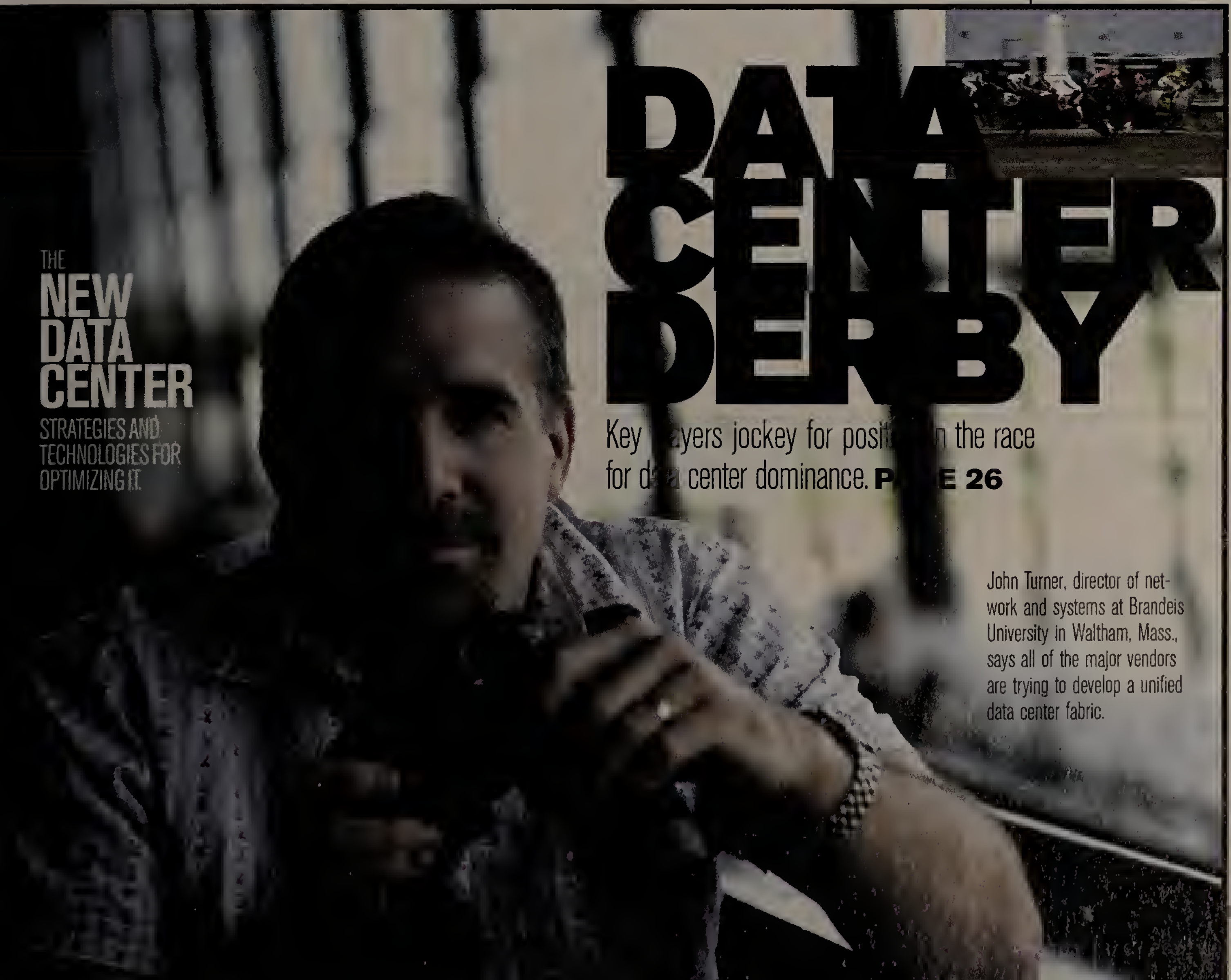

DATA CENTER DERBY

Key ayers jockey for posit n the race for d a center dominance. P E 26

John Turner, director of network and systems at Brandeis University in Waltham, Mass., says all of the major vendors are trying to develop a unified data center fabric.

GOODBADUGLY

Going mercury free

Sony has developed a new type of alkaline manganese button-cell that contains no mercury and will put it on sale later this year. Alkaline manganese cells are commonly used in cameras, remote controls and calculators and are one of several types of button-cell batteries, so-called because the small, round, metal-cased batteries look similar to buttons. When not properly disposed of, mercury can contaminate groundwater supplies and enter the food cycle.

Bad bills

A handful of bills in state legislatures are creating the biggest legal threat to e-commerce in several years, trade group NetChoice said. NetChoice released its first Internet Advocates' Watchlist for Ugly Laws, with state legislation making up nine of the 12 bills on the list, and the remaining three bills in the U.S. Congress. The combination of a struggling economy and the move of more activities online has created a major push to regulate the Internet, said Steve DelBianco, executive director of NetChoice. Topping the list is a New Jersey bill that would create new civil and fraud penalties on social-networking and other Web sites for failing to investigate and report to law enforcement complaints about sexually offensive and harassing comments posted on their pages.

McAfee, Symantec get slapped

Antivirus vendors Symantec and McAfee have agreed to pay the New York Attorney General's office $375,000 each in fines to settle charges that they automatically charged customers software subscription renewal fees without their permission. Investigators found that the two companies had "failed to adequately disclose to consumers that subscriptions would automatically be renewed and that consumers would be charged," the office of Andrew Cuomo said in a statement.

This is one war the DoD isn't trained to win

Re: 10 things you didn't know about cyberwarfare (http://tinyurl.com/lozdnv):

I would ask the question of whether or not the DoD is even the correct organization to "take over" networks in some sort of massive cyberattack. If we're talking ground-pounders, rifles, Predators, missile subs, jet jocks and Seals/Rangers/Green Berets, then we have the best of the best and I'd want them defending us every moment of the day.

However network infrastructure is a completely different animal. And from that perspective, military and government networks are constantly under threat and have had serious breaches because they can't keep up with their own protection requirements.

As Gene Hackman's character in "Enemy of the State" noted, bureaucracies tend to be big and slow and the guerrilla counters by being small and fast and using their own products against them. So in the end, aren't we safer by keeping networks diverse and allowing each to protect his own? Obviously there are key areas that need to be protected such as marine cable landing points, root DNS points, etc.

What we don't want to do is open the door toward massive government enforced network policies and requirements, such as those underway in China. Does anyone really want massive censorship, Web site/proxy blocking, key-logging, etc. If we allow the DoD or any other arm of the federal government to get their fingers into private industry and private homes, then we will have signed away our liberty and our freedom.

spee

Netbooks are an education in slowless

Re: NSW education drops $150M for 267,000 netbooks (http://tinyurl.com/n2a48j):

Netbooks are for basic Web browsing, not for cutting-edge computer usage. Agree or disagree as you want but that's where kids are —the future/the cutting edge. Not stuck back using "new" machines that are slower than my 2004 laptop I use as a door stop. If anyone seriously thinks they will be using Adobe CS4 on these machines they are kidding themselves. Cutting up video... you have to be joking! These machines are so slow they better leave them running overnight if they expect a video to ever cut up. And I thought we'd be able to see the next generation in interactive education content but alas, not for another three to five years.

anonymous

A pet peeve about password and security questions

Re: Hackers claim $10,000 prize for breaking into StrongWebmail (http://tinyurl.com/ozpr2s):

Usernames and passwords actually can provide very good security. They aren't the problem. The problem is "security questions"— if it weren't for those, free Webmail accounts would be very difficult to break into.

Even if someone is using "ASdlw3ru84t" as their password, their account is as good as public if they said that their first pet's name was "Spot." The password never even gets a chance.

anon

Welcome to wireless pricing

Re: Angry iPhone owners blast AT&T over upgrade pricing (http://tinyurl.com/lpkc7d):

That is the way the wireless industry works. Do the iPhone owners think they are the only ones with this problem? If you want the newest LG and you are still under contract, you pay hundreds more. Want a new Samsung while you are under contract, you pay hundreds more. They were babied when the 3G came out and were allowed subsidized pricing even when they are under contract. Don't expect it every year.

Anonymous

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 492 Old Connecticut Path, Framingham, MA 01701-9002. Please include phone number and address for verification

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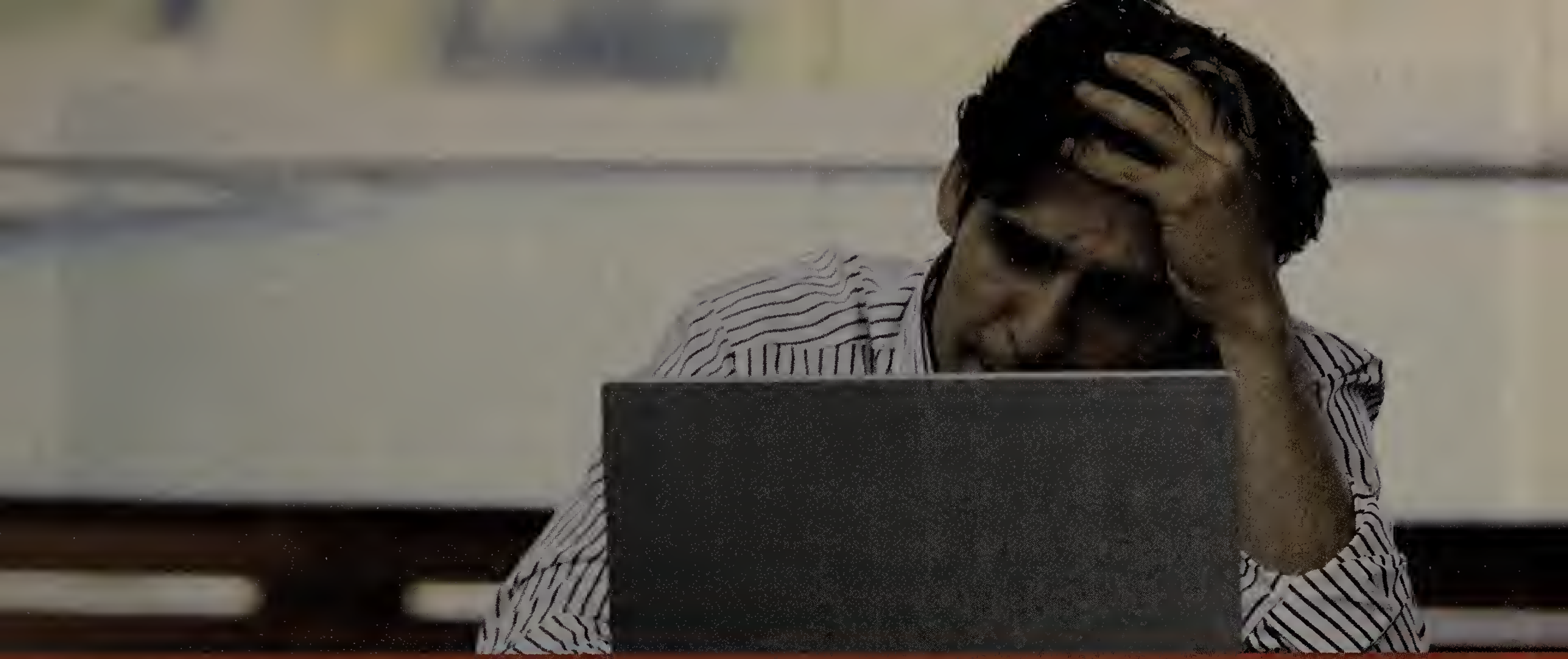

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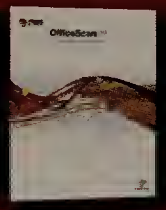

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2009 top urban legends in IT security. *Network World* blogger Jamey Heary has found many IT security related urban legends floating around the Internet. Some have malicious intent and others are just for fun. Some have been with us for years but still refuse to die. Here are a few from a list of his top IT Security Urban Legend picks for this year.

1. Department of Homeland Security mandates that all PC manufacturers install keyboard-logging devices in all PC keyboards.
2. Internet Spring Cleaning. Another oldie but goodie, I bet we'd be surprised at the number of people who still believe stuff like this.
3. Don't Answer that Call Virus. This legend is about a new cell phone virus that infects the phone when you answer a call from certain malicious numbers like "unavailable". It was a big scare in certain circles in early 2000.
4. Hackers can legally break into Web sites that lack "warning" notices. This urban legend is pretty self-explanatory. If you have a Web site that doesn't post a proper "don't hack me" warning notice then you will be unable to hold a hacker liable. It also works the other way to; a script kiddy might believe this legend and start hacking sites that don't post the proper warnings thinking he is doing nothing illegal.

http://tinyurl.com/nvgqao

DOJ investigates Google's deal with book publishers. *Network World's* Google Subnet reported that the Department of Justice is poking around a deal between Google and at least two book publishers that may have antitrust implications, reports *The Wall Street Journal.* The Department of Justice antitrust division has reportedly contacted some publishers seeking information on a deal reached with Google to create its Book Rights Registry and to implement Google's plans to scan millions of copyrighted books online, allowing searchers to browse passages and purchase copies. Google agreed to pay $125 million to create the Book Rights Registry, where authors and publishers may register works and receive compensation from institutional subscriptions of book sales, according to Reuters. Critics have said that the book search plan would give Google too much power in the young electronic book publishing market and the U.S. District Court is investigating the deal. When adding in the fact that Google has plans to create its own Kindle-like device, critics may have a point. **http://tinyurl.com/mcqze6**

IT VIDEO

INTERVIEWS, THE COOLEST TOOLS AND MORE

IDG NEWS WIRE:

iPhone 3GS offers speed boost, video

At last week's World Wide Developers Conference in San Francisco, Apple announced a host of products including hardware and software updates for the iPhone.

http://tinyurl.com/lj69lm

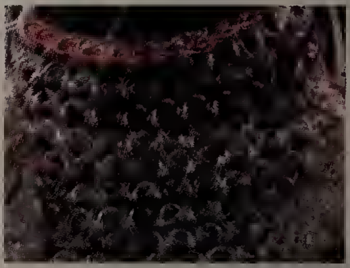
TECH UPDATE 2.0:

Electronic contract execution

Tom Gonser from DocuSign discusses how executing contracts across the Internet can save companies money by speeding up the contract signature process.

http://tinyurl.com/mq7w38

IDG NEWS WIRE:



Maker Faire highlights

Quick looks at various projects from California's Maker Faire, including the electronic marionette and the liquid dress.

http://tinyurl.com/m8mysh

BEST OF NWW'S NEWSLETTERS

No IT budget? Invest in best practices

Network/systems management: IT departments without funds to buy tools and technologies could invest time in improving processes to streamline work, save staff hours and ultimately cut costs for their company. As more companies cut IT budgets, one might think that adoption of best practice frameworks such as ITIL would be on the rise. According to a Forrester Research report, 62% of more than 500 IT decision-makers polled said improved consistency and quality of IT processes were among the key changes contributing to a more positive view of IT by the business. Yet recent survey results from BT show that ITIL adoption isn't on the rise. From April 15, 2009, through May 11, 2009, BT in North America conducted a Web-based survey on ITIL, which was completed by 225 IT professionals around the globe. About 44% of those surveyed in 2009 employ ITIL best practices, compared to 51% of 300-plus IT pros polled by BT in 2007 that reported they use ITIL to improve on IT service management processes. And 28% of organizations not currently using ITIL plan to do so within 18 months. But more than 50% currently have no plans.

http://tinyurl.com/ncm5fl

Network optimization: Lots of folks talk about aligning IT with the business, but it's not always easy. Recent research from Aberdeen Group found that many companies don't know how applications are used in key business processes, and they often can't easily determine how many users are impacted when there's an issue with application performance. As users' expectations of application performance increase, companies are going to have to step up their performance-management efforts.

"Organizations are increasingly looking to be more proactive when managing application performance and their IT departments are being tasked with a new challenge: how to identify and resolve potential performance issues before they impact end-user productivity." reads the report written by Bojan Simic. As part of its research, Aberdeen identified the top challenges for application performance, including the inability to identify performance issues before users are impacted (cited by 61% of respondents) and the inability to measure the business impact of issues with application performance (49%).

http://tinyurl.com/nsbb4l

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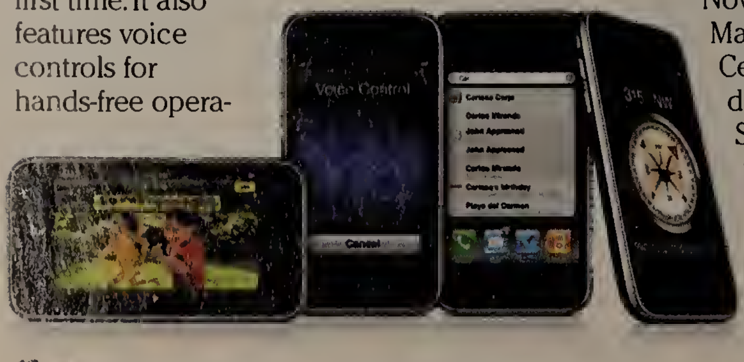
Windows 7 to be sold in Europe without a browser

Windows 7 will ship without Internet Explorer in Europe, in an effort by Microsoft to offer the product on time and without running afoul of competitive regulations. The move stems from a complaint that Web browser developer Opera filed with the European Commission last year saying that Microsoft gets an unfair advantage by tying IE with Windows. Mozilla has joined Opera in the suit. "We're committed to launching Windows 7 on time in Europe, so we need to address the legal realities in Europe, including the risk of large fines," Dave Heiner, deputy general counsel at Microsoft, wrote in a blog post. PC makers and distributors will be able to add any browser to the Windows 7 machines, and Microsoft said it plans to make it easy for them to do so. **http://tinyurl.com/kpse5m**

Feds dole out $450 million for U.S. jobs lost to outsourcing. The U.S. Department of Labor has released more than $450 million in assistance to be used by states for career training and employment services aimed at workers who lose their jobs due to outsourcing and foreign trade. The funding comes by way of the Trade Adjustment Assistance program, which recently gained more funding as part of the American Recovery and Reinvestment Act of 2009. The $450-plus million in funds will be distributed in varying amounts to the states. For instance, Alaska will receive $594,032 in fiscal 2009, while California is allotted more than $21 million. "Workers around the nation continue to see their jobs disappear as a direct result of increased imports and competitive trade," Secretary of Labor Hilda Solis stated. "The funding announced today will help more of these workers upgrade existing skills or retrain for new careers in industries that have the potential to grow in the coming months and years." **http://tinyurl.com/mqudj4**

New iPhone 3G S offers faster CPU, cellular connectivity. Apple's new iPhone model features a more powerful CPU, a better camera and video recording. Perhaps just as importantly, Apple slashed the price of the previous iPhone 3G to less than $100. The new iPhone 3G S boasts the recently announced iPhone OS 3.0, which includes a multitude of new features and APIs. The handset adds a 3-megapixel camera and supports 30 frames/sec video recording for the first time. It also features voice controls for hands-free operation. With a 16GB flash drive, the 3G S is priced at $199. With 32GB, it rings in at $299. The older iPhone 3G with 8 GB and a 2-megapixel camera drops to $99. The 3G S model goes on sale in the United States on June 19, still exclusively on the AT&T cellular network in the United States. It requires a two-year contract. **http://tinyurl.com/lrafct**



Cisco and Duke Energy work to build smart grid. Cisco has been enlisted by a Fortune 500 electric power company to monitor and control power consumption by creating a smart grid. Duke Energy, a $13.2 billion company delivering electricity to 11 million customers in five states, has hired Cisco for three years to help design an IP network that will push Duke Energy monitoring gear into its distribution network and even customers' homes. The system will gather data about network load and performance, and be able to adjust consumption in homes equipped with energy-management devices. Cisco will help develop and install these devices as well as communications gear for electricity substations, said Todd Arnold, senior vice president for smart grid and customer systems at Duke Energy. **http://tinyurl.com/mq4a8c**

Novell tool links Linux, Windows management. Novell plans to release yet another tool that is the product of its 3-year-old integration agreement with Microsoft, this time a plug-in for Microsoft's management tools that lets users monitor both Linux and Windows environments from one console. Novell's SUSE Linux Enterprise Management Pack for Microsoft System Center Operations Manager is designed to extend across seven SUSE Linux Enterprise OS services the monitoring capabilities within Operations Manager 2007 R2. The tool, which will ship June 19, was produced as part of Novell's involvement with the Microsoft/Novell Interoperability Lab, which opened in 2007. **http://tinyurl.com/kmmxxz**

Symantec vows huge push into SaaS market. At an analyst event in San Francisco last week, Symantec's top executives vowed a major push into software-as-a-service and offered a glimpse at upcoming backup products. Symantec already has SaaS experience; the company backs up 32 petabytes of customer data in the cloud with continuing growth at 5 petabytes each quarter. Looking ahead, CEO Enrique Salem predicted SaaS offerings could comprise 15% of total revenues in the next five years. Among new SaaS products in development is a cloud storage platform. Separately, Symantec gave more specifics about upgrades to existing products. NetBackup 7.0, expected out the second half of the next fiscal year, will include deduplication and application recovery for Oracle, while Backup Exec 2010 will include a light version of Enterprise Vault in it. **http://tinyurl.com/nnu39a**

Firefox 3.5 features new Javascript engine, built-in video. The next version of Firefox will include features Mozilla hopes will help the browser stand apart from competitors. Firefox 3.5, which is due out in final release at the end of the month, will users edit digital images from within the browser without need for a third-party application, due to a new Javascript engine Mozilla has built for the browser, said Mike Beltzner, director of Firefox at Mozilla. The new Javascript engine, called TraceMonkey, is twice as fast as the one in Firefox 3.0. The software also will include the ability to run videos directly in the browser without the need for a third-party viewer or player, and will allow other elements of a Web page to interact with that video content, Beltzner said. The new video capability is based on the open source video codec called Ogg. **http://tinyurl.com/ms5pu4**

More employees neglecting data security, survey says. More employees are ignoring data security policies and engaging in activities that could put a company at risk, according to Ponemon Institute. Around 69% of the 967 professionals surveyed said they copied confidential company data to USB sticks, even though it was against the rules, and 53% said they downloaded personal software on corporate PCs. Some blamed companies for poor training or ineffective data security policies. Close to 57% said their company's data protection policies were ineffective, and 58% said they were not provided with enough data-security-related training. The rate of noncompliant behavior was worse in this most recent survey compared with a similar survey conducted in 2007, Ponemon Institute said. **http://tinyurl.com/lgcoy8**

Nortel customers upbeat but anxious

BY JIM DUFFY

Nortel customers remain optimistic despite the company's precarious situation, officials of Nortel's largest enterprise user group said last week.

Speaking for the Global Connect conference in Pittsburgh, leaders of the International Nortel Network User Association (INNUA) said the general tone among customers was upbeat despite the company filing for Chapter 11 bankruptcy protection early this year. But attendance at Global Connect is down about 40% from last year.

"The customers are very optimistic," said Steve Ford, INNUA president and telecom manager at Northeastern State University in Tahlequah, Okla. "[Nortel CEO Mike Zafirovski] reaffirmed his commitment to the customer and the product line going forward."

The top priority for Nortel is to not lose any customers, Ford said, referring to a briefing INNUA members had from Zafirovski and Joel Hackney, president of Nortel Enterprise Solutions group. He said members were also encouraged that Nortel wants to get its restructuring and operating model going forward as soon as possible.

"They realize that everybody's antsy and they've acknowledged that orders have been down because everybody's waiting to see what happens," Ford said.

Hackney, at Interop, said customers have stopped buying Nortel products for the time being. Reports also surfaced this week that a group of former Nortel executives are looking to buy the company.

"They understand that the sooner they can get something announced [on the company's future], the better it will be for everybody," Ford said. INNUA officials said Nortel's announcement is "imminent."

Nortel has until July 30 to detail its restructured operating model. Many believe it will sell off large chunks of its business — it's already shopping around its LG joint venture, among others.

Customers expect the Nortel enterprise portfolio to "carry on," said Victor Bohnert, INNUA executive director.

"Their investments are safe," Bohnert said of Nortel enterprise customers' deployments. "They're looking for a road map through the transition. Most of us expect that the strength of their solution will continue moving forward."

Bohnert said attendance at Global Connect has fallen off due more to the economy in general than Nortel's plight. But Nortel's bankruptcy was No. 2 on the list of reasons why customers did not attend, he said.

At the conference, Nortel announced the latest version of its Agile Communication Environment — ACE 2.0 — and a new release of its Media Processing Server (MPS), a Web-centric Interactive Voice Response system for call centers.

ACE is a software platform that provides Web access to instant messaging, voice, video, location, and presence services. Release 2.0 includes features such as hot-desking — or cross-PBX remote call forwarding accessible from a Web browser — further integration with IBM Lotus Sametime, support for the Microsoft Windows Server operating system and remote call control features for Microsoft Office Communications Server 2007.

Release v3.5 of MPS, meanwhile, supports the latest IBM and Nuance speech engines; VoiceXML, to provide an environment for accelerating application development; and expanded third-party integration support into Avaya AES. ■

IT financing

continued from page 5

technology as long as it's part of a larger project involving their own products.

Customers can borrow money from commercial banks, but there are advantages to borrowing from the vendor, Rothman says. As part of a financing or leasing agreement, HP can help customers dispose of obsolete equipment in an environmentally friendly way and without exposing sensitive data.

According to Dicks, IBM keeps its interest rates competitive in part by taking back old equipment, refurbishing it and reselling it.

A typical IT financing or leasing deal lasts three years. While some zero-percent loans have been offered, typical interest rates can range anywhere from 4% to the low teens, according to Graves.

Companies with bad credit ratings shouldn't expect an easy ride just because the vendor wants to sell them a product, Pucciarelli says. Even when financing is provided by an IT vendor, the terms have to be responsible. "In the current market, you don't want to be 'aggressive' in financing," he says. "What you want to do is make capital available, on reasonable terms, to companies that have the financial means to handle it."

For some customers, financial considerations aren't the deciding factor when it comes to choosing whether to lease, finance or buy outright, Graves says.

One large government customer of Dell's switched from purchasing to leasing because its IT infrastructure had gotten out of date, and it didn't want that to happen again, Graves says. "They chose to lease, not for budgetary reasons but to force them into a technology decision every three years," he says. ■

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Google's Outlook interface falls short

Vendor has yet to define how it might take leadership in enterprise e-mail

BY JOHN FONTANA

While Google is in hot pursuit of an enterprise e-mail business, the announced support last week for Outlook as a client interface for Gmail does little to distinguish the vendor from other players chasing top-dog Microsoft.

Google unveiled Google Apps Sync for Microsoft Outlook, synchronization technology that supports Outlook as the front end to Gmail. It gives administrators an option to scrap Exchange for Gmail on the back end while allowing users to keep their desktop client.

But it was little more than needed catch-up to a crowded field of vendors offering corporate users alternatives to Exchange, and a thin cover-up for the fact that Google had nothing to say about how Google Apps Premier Edition (GAPE) and its recently announced Google Wave might team up to redefine messaging and collaboration.

"[The client] was the limiting factor of Gmail," says Guy Creese, analyst with the Burton Group. "There are some people who like the Gmail interface — universities and their students are in that category — but you have others for which Outlook is ingrained in the way they work and if you take away Outlook you are taking away their security blanket."

Given that fact, many of Google's competitors long ago saw fit to support Outlook as a client in their battle-against-Exchange strategies, including IBM and Novell, and lesser known alternatives such as Alt-N Technologies, CommuniGate, Gordano, Kerio, Mailsite Fusion, Open-Xchange, Scalix and Zimbra.

Outlook integration had been a lingering checkbox Google had yet to fill, but it is only one bit of an enterprise e-mail story that is captivating universities and smaller companies but not larger enterprises.

Forrester Research reports that most inquires it fields are from companies up to 8,000 employees. The interest is mostly related to cost savings or business-to-business relationships.

Google Apps Sync for Microsoft Outlook provides synchronization for e-mail, calendar and contacts between Gmail and Outlook/Exchange, which is equal or less functionality than other competitors provide.

Google's previous one-off kluge of integration technologies for Outlook often came under criticism from analysts and Google users alike for being disjointed and slow.

On his blog, Rafael Laguna de la Vera, CEO of Open-Xchange, an on-premises and hosted provider of Linux-based e-mail platforms, called Google's Outlook support "basic."

"People also like mail filters, changing their passwords — the full Outlook experience, as ugly as it may be. We've been there, and done that… . It is quite amazing that big G finally realizes that integration into other foreign platforms is so important, because people are so used to them."

As Google catches up on the front end, it is being caught on the back end.

While Google's data center that hosts Gmail is robust, outsourced e-mail is nothing new and there is plenty of competition from Microsoft with its Business Productivity Online Suite, IBM's Hosted Notes and Yahoo's Zimbra.

There are also e-mail service providers such as AT&T, HP and EDS. And new to the game is Cisco, which with last year's acquisition of PostPath, now provides cloud-based e-mail.

Google's current users, however, welcomed the Outlook news.

"We saw Outlook performance as a major hurdle to rolling out Google mail across our enterprise," says Chris O'Connor, IT director at Genentec, Google's largest corporate customer. O'Connor now has 1,000 users on Outlook out of 15,000 Gmail users. He says IMAP was the cause of the performance hurdle. "We have been using the new tool in our sandbox and have come to the conclusion that it looks like a native Outlook experience and the average user does not know what is on the back end. We expect quick adoption when we release this to our enterprise users."

Google is wondering about adoption as well, and how Outlook support will help not only Gmail, but GAPE, the enterprise messaging and collaboration suite Gmail anchors.

Since launching GAPE in February 2007, the company has added SAS 70 Type II certification, built a reseller channel to handle support, added offline capabilities, integrated with Microsoft's Active Directory, and laid out $625 million for e-mail hygiene vendor Postini, which provided the compliance and archiving tools GAPE lacked.

Google also added video features based on capabilities inherited from its YouTube division. And Google's partners are busy ratcheting up GAPE's feature set.

"Google is teeing these things up and knocking them down one at a time and removing enterprise adoption barriers," says Ted Schadler, an analyst with Forrester.

"In doing that, they are saying they are committed to the enterprise."

What they aren't saying is how they plan to deliver something that redefines messaging and collaboration, moves it online, and elevates the result to a must-have for corporate users.

The best innovation effort Google has made to date is its Google Wave package of online communication and collaboration tools introduced two weeks ago.

"Wave is going to get into enterprise hands as fast as it can," Dave Girouard, president of Google's enterprise division, said last week during a press conference to introduce Outlook sync. Girouard said users will see Google compress its test model – vetting technology in a prolonged beta stage with consumers.

But he stopped short of what Wave would mean to corporate users once it was delivered.

"My belief is they don't know how Wave is going to reach the market yet," Forrester's Schadler says. "However, I expect to see it in Google Apps at some point. There is no reason for them not to make it a part of [GAPE]."

And when that day comes, Google's best hope is that it will define innovation and leadership and not have the same "me-too" feel as the debut of Outlook synchronization. ■

Outlook meets Gmail

Google last week introduced a synchronization plug-in that allows the Microsoft Outlook client to work against Gmail on the back end. Basically, Google has built its own MAPI provider. Here is a look at the key capabilities:

- **E-mail, calendar and contacts synchronization:** The offline Gmail protocol speeds communication between Outlook and Gmail server.
- **Free/Busy lookup and Global Address List support:** Users can schedule meetings and update colleagues' calendars regardless of their client application — Outlook's calendar or Google Calendar.
- **Two-click data migration tool:** Users copy existing .pst file data from Exchange or Outlook into Google Apps.
- **GData:** A simple protocol developed by Google for reading and writing data on the Internet.

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10 cyberwar gotchas

BY CAROLYN DUFFY MARSAN

NEW YORK — Imagine a situation where a powerful country wants to annex its small neighbor, so it launches a week-long campaign of cyberattacks aimed at disrupting the financial, energy, telecom and media systems of its neighbor's biggest ally. A week later, the aggressor launches a full-scale cyberwar on its neighbor that includes air and naval defenses. With its ally's defenses weakened, the neighbor agrees to become a province of the aggressor in less than a week.

This scenario is not so far-fetched, according to several experts from the National Defense University who spoke last week at the Cyber Infrastructure Protection Conference.

The panel discussion on cyberwarfare is timely given the Obama administration's push to raise awareness and federal spending on cybersecurity initiatives. The president issued a cybersecurity plan earlier this month that includes naming a new high-level cybersecurity coordinator. (See related story, page 21.)

Experts from the National Defense University, the premier academic institution providing professional education to U.S. military forces, say it is critical for the private sector to realize it will be a target of future cyberwarfare.

"Our adversaries are looking for our weaknesses," says Dan Kuehl, professor of information operations at the National Defense University. "We conduct military operations that are increasingly information dependent. We have a global society that is increasingly dependent on critical infrastructure, and those infrastructures are increasingly interconnected in a global economy."

Kuehl points out that it's inexpensive for terrorists or hactivists to launch a cyberattack, but it's very expensive and difficult for a country such as the United States to defend its networks and systems against these threats.

"The weaker party may have a very important asymmetric advantage," Kuehl says. "Winning in the cyber realm may decide the course of the war."

One example of how weaker parties have an advantage in cyberwarfare is the recent terrorist attacks in Mumbai. Stuart Starr, distinguished research fellow at the National Defense University, said the attackers used Google Earth and GPS technology to locate themselves with respect to everybody else.

"They took advantage of hundreds of billions of dollars of investment by buying low-end equipment," Starr said. "These guys are getting a phenomenal benefit from taking advantage of commercial investments."

Here is a list of 10 things you probably didn't know about cyberwarfare:

1. You need to win the first battle. In conventional warfare, the country that wins the first battle doesn't necessarily win the war. Think Pearl Harbor. But with cyberwarfare, you need to win the first battle because there may not be a second. The enemy may have so wiped out your critical infrastructure through coordinated cyberattacks that you can't mount an effective defense and are forced to surrender.

2. The first battle could be over in nanoseconds. Cyberattacks are stealthy. The enemy has already penetrated your networks, attacked your systems and stolen or manipulated your data before you realize that anything is wrong. Once you discover the cyberattack, you have to figure out who did it and why. Today, this type of computer forensics can take days or weeks. By then, you may have lost the war.

3. Cyberwarfare may involve subtle, targeted attacks rather than brute force. Most people equate cyberwarfare with the massive denial-of-service (DoS) attacks that Russian activists aimed at Estonia in 2007. But cyberwarfare doesn't need to be waged on such a large scale. Instead of taking out the entire electric grid, a hacker could take out a substation that supports a particular air defense system. Much as we have precision-guided missiles in conventional warfare, we may have precision-guided cyberattacks.

4. The enemy's goal may be to cause chaos rather than destruction. We tend to think about an enemy blowing up buildings or transportation systems during war. But the political objective of cyberwarfare may be to generate chaos among citizens rather than to destroy infrastructure. For example, what if an enemy launched a cyberattack against a country's financial systems and it appeared that everyone's money was gone from their banks? That kind of attack wouldn't require bombing any bank buildings to create chaos.

5. Data manipulation — rather than data theft or destruction — is a serious threat. During the Persian Gulf War, a group of Dutch hackers allegedly penetrated dozens of U.S. military computer systems and offered to provide their help to Saddam Hussein. When the breaches were discovered, the military had to stop some deployments and verify that the data in their databases were accurate and hadn't been manipulated by the hackers. This incident demonstrates how misinformation inside hacked computers systems could harm a country's ability to respond to a cyberattack.

6. Private networks will be targets. Most of our country's critical infrastructure — energy, transportation, telecommunications and financial — is privately owned. The companies that operate these networks need to understand that they are certain to be targeted in cyberwarfare, and they need to spend money accordingly to secure their networks, systems and data. This is one reason military experts recommend that operators of critical infrastructure engage with government officials and set up procedures and protocols before they are attacked.

7. When private sector networks are hit, the Defense Department will assume control. There's a misconception that the owners and operators of critical infrastructure are responsible for cybersecurity. That perspective won't hold up in the face of cyberwarfare, experts predict. Just as the military is responsible for securing the airspace and ground around an electricity plant, so it is going to assume responsibility for the cybersecurity of that plant if a cyberattack should occur, they warn.

8. Private networks might be used to launch a cyberattack. If companies don't properly secure their networks, their systems may be taken over by a botnet and used in a cyberwarfare incident. For example, two-thirds of the computers used to launch DoS attacks against Estonia were inside the United States although they were controlled by Russian hactivists, experts say. Typically, the machines used in a cyberattack are not owned by the attacker. Most companies don't realize they are vulnerable to having their network assets being used for cyberwarfare.

9. Don't ignore the insider threat. One of the biggest vulnerabilities in networks is from insiders with legitimate access to computers and data. The same threat exists in cyberwarfare. One way this threat might occur is for the enemy to kidnap a family member of a network operator and then force the network operator to install malware. That's one reason government agencies and private companies running critical infrastructure need adequate security controls over their employees.

10. Cyberwarfare is warfare. Looking at cyberwarfare as separate from traditional warfare is a mistake; it has to be tied to physical warfare, experts say. For example, an enemy might blow up a building on the ground that disables a satellite, which in turn disables Internet access. In a cyberwar, network attacks will likely be combined with physical attacks. ■

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VMware reaches for the clouds

Major upgrade features faster hypervisor and improved management features that allow virtual machines to span internal/external server farms

BY TOM HENDERSON AND BRENDAN ALLEN, NETWORK WORLD LAB ALLIANCE

VMware's vSphere 4.0 is a massive update to VMware's flagship hypervisor and management toolset that will put significant pressure on Microsoft and the Xen development community. We found vSphere faster than its predecessor,VMWare's ESX 3.51, easier to manage and good for provisioning fleets (dare we say "clouds"?) of virtual machine (VM) farms.

As part of its updated licensing scheme, the company offers vSphere in four gradations called Standard, Advanced, Enterprise and Enterprise Plus, which costs a hefty $3,495 per processor.

The basic components of what VMWare calls the vSphere cloud operating system are an improved hypervisor and VMware's VirtualCenter management application, along with graduated improvements per edition, including options such as vMotion (live VM inter-server migration), vSphere Zones (network security aggregation), distributed resource allocation, and even a distributed network switch.

These improvements enable vSphere 4.0 to manage and automate provisioning of internally-controlled VM farms and infrastructure with hosting platforms located outside an organizations traditional computing perimeter.

In terms of enterprise deployment options, we recommend the Standard package for internal use only. A secure deployment also calls for advanced firewalls, virtual LANs, authentication and VPNs. Many organizations already have these security resources on hand. Others will find that the additional resources feel like a tax.

The pricier Enterprise versions are needed to control external server resources. However, the 'full meal deal' still provides cost effectiveness compared with provisioning individual servers with dedicated applications/line-of-business applications. Longer term, as the cost of hardware falls, the VM substrate, while convenient, could lose some of that cost effectiveness.

Powerful new features

The term cloud is synonymous with what were once called "farms" or "hotels" in systems terminology. To this end, VMware has added many components to the core of what was once VMware Infrastructure and its ESX hypervisor that manage the aggregate assets associated with virtualization for an enterprise.

For example, vSphere adds to Microsoft's own Powershell as the basis for new vSphere commandlets. These VMware PowerCLI "cmdlets" let us to mass-provision a "skyful" of VMs into the computing geography of our choice.

There are more than 150 cmdlets available, and while their use is just as terse as those cmdlets provided by Microsoft, they're also very powerful in some cases. We could provision massive numbers of VMs with a simple PowerShell script, and tear them down just as easily. Security for use of PowerCLI cmdlets is controlled strictly via Microsoft's Active Directory services, which need to be perfected prior to deployment. An absconded administrative logon could wreak havoc.

Obtaining this functionality for VMware ESX existing servers via upgrade was mindlessly simple in our lab environment. We used an NFS share to load the upgrade components — a CD or DVD of the upgrade components can't be used.

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NETRESULTS

Product	**VMware vSphere 4.0**
Vendor	VMware www.vmware.com
Price	Four editions, top price $3,495 per processor socket.
Pros	Virtual machine asset management extremely flexible; excellent storage abstraction.
Cons	Expensive at top tier; security and audit not as evolved as management controls.
Score	**4.25**

SCORECARD

Action	**Weight**	
Administration/management	25%	**4.5**
Installation/compatibility	25%	**4.5**
Security/authentication/user roles	25%	**4**
Features/performance	25%	**4**
Total score		**4.25**

Scoring key: 5: Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Subpar or not available.

One note of warning: We found that the upgrade can disturb bootloaders (grub in our case) if your ESX 3.5 setup isn't the "expected" way; caution is needed here. The vSphere installation routine upgrades all VMware tools after installation, too. These tools are VM guest-dependent, and contain administratively optional hooks that improve management.

Once vSphere was alive, we tried vApp, a resource that groups together VMs as aggregations for object control purposes, such as starting them, powering them down, and allowing them to be treated as a single object. We're reminded of the big red switch that turns on stadium lights.

Better still is Datastore Migration that allows a running VM's connected storage to be virtualized — and moved to a different logical drive on the fly. Our drive might be in the local server, or it could be changed to another drive via iSCSI (or an NFS share, Fibre Channel) at will.

This further abstracts storage from a virtualized operating system/application instance in a way that makes far better utilization of storage-area network resources — by trapping and redirecting storage. If you're not prepared for what your applications might do, it could be a disaster when files/folders/locks are missing, so using this is state-dependent on what a particular VM is doing at the time. Nonetheless, we liked the VM instance availability that could be anchored from this ad hoc disk change capability.

VSphere allows as many as eight virtual CPUs (vCPU) for any specific VM instance, double the vCPUs permitted in the prior version. With this addition comes the capacity to also add/subtract VM instance allocated

See VMware, page 21

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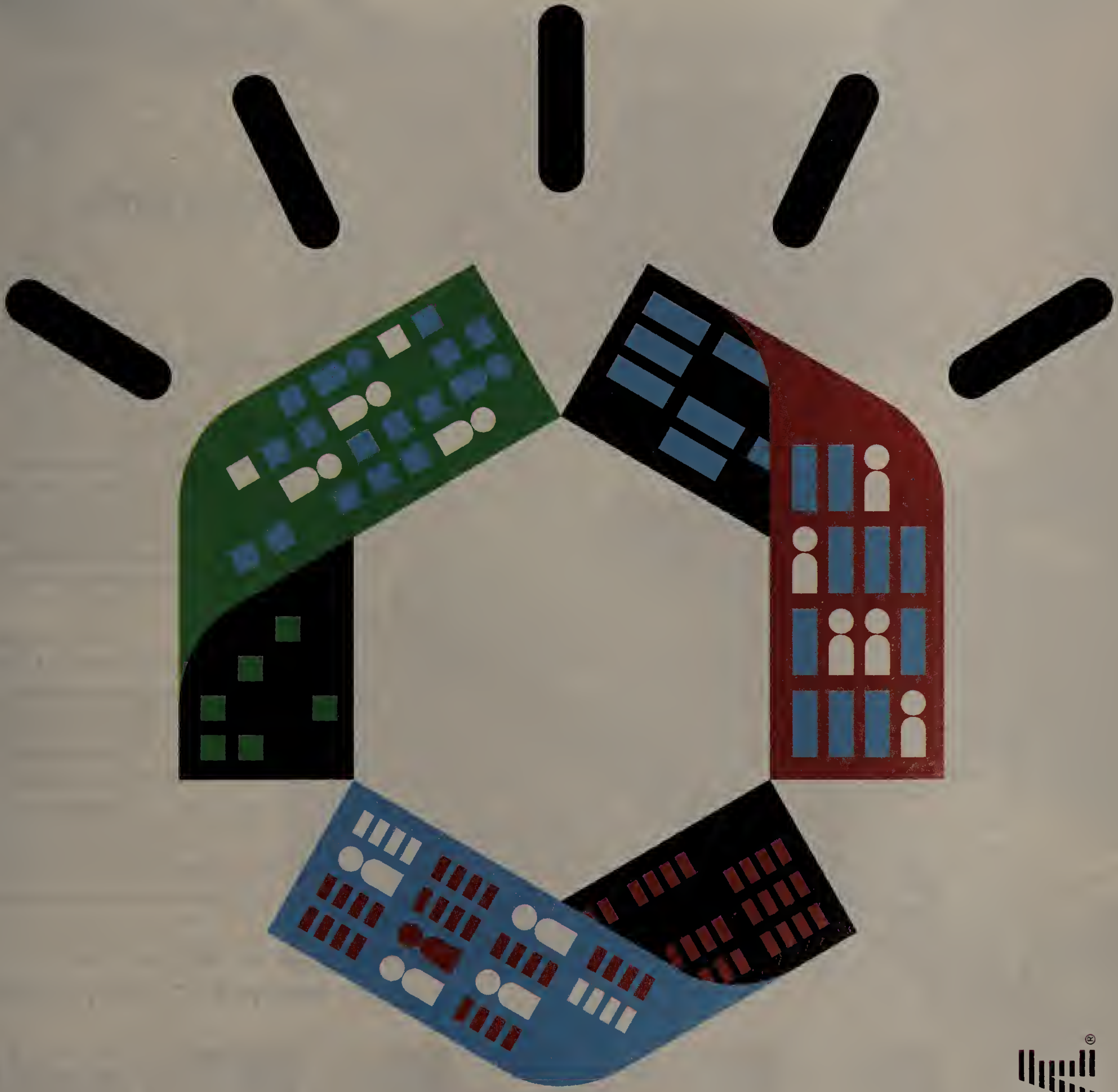

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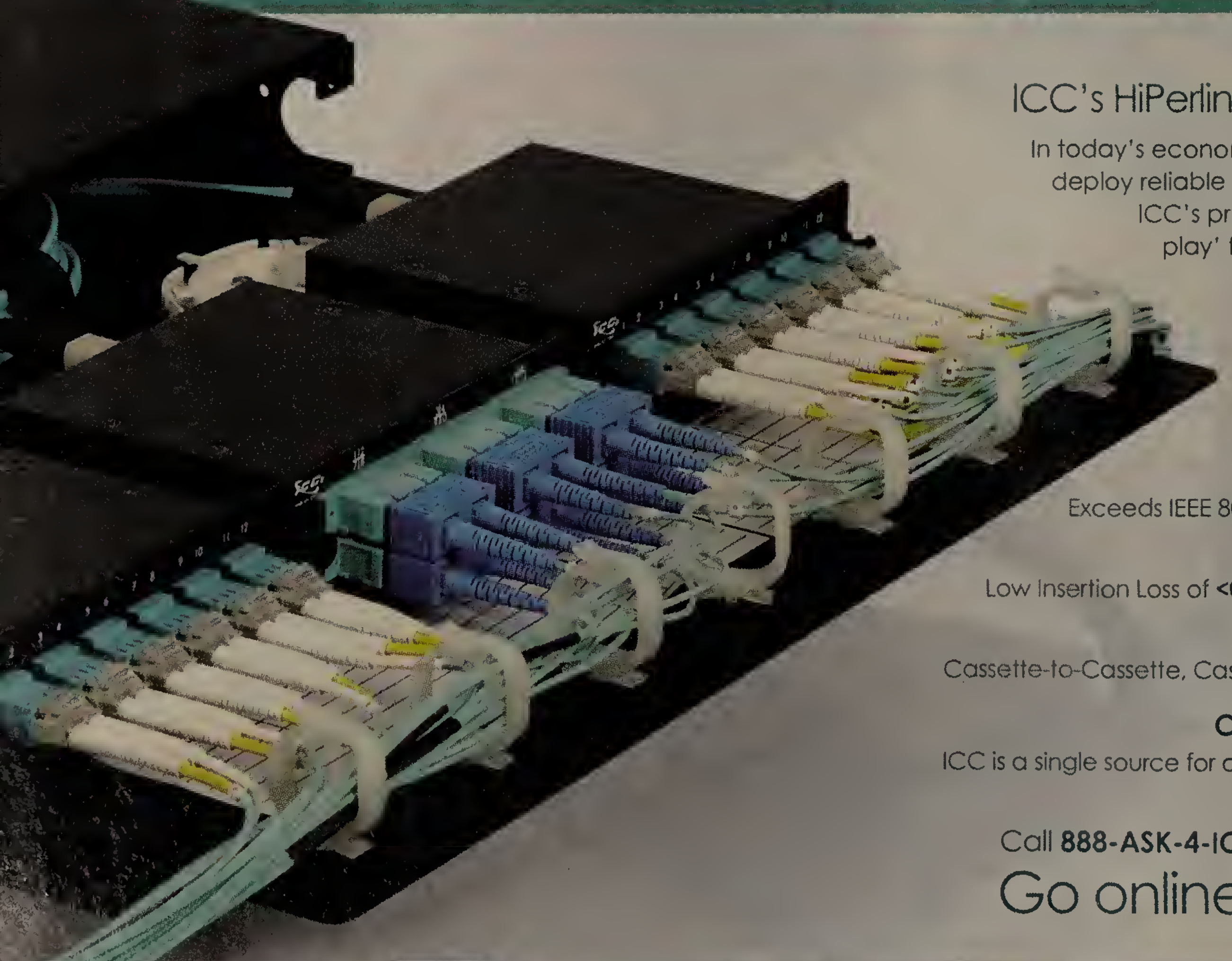

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VMware

continued from page 18

memory or vCPUs on the fly, depending upon the guest operating system in the VM.

The implications of hardware resource additions/changes are interesting, especially in test platforms where tinkering with these settings can find performance optimization points with varying resources for a virtualized operating system and hosted application performance.

Performance

The new vSphere ESX 4.0 hypervisor performed about the same as its predecessor when we ran three VM guests on a single virtual CPU, but improved when we gave the VM guests more vCPUs. We tested vSphere's ESX 4 vs. the older 3.51 and found across-the-board improvements. We also upgraded virtual hardware drivers to see its impact.

We tested vSphere 4.0 on the same HP DL-580G5 server that we've used in the past, in order to compare performance numbers between vSphere and its latest competitors, including speed demon Citrix XenServer. We tested with SPEC's SPECjbb2005 using the exact same Windows 2008 Enterprise Server (R1) and Novell SUSE Linux 10.2 that we've used in other tests.

Overall, VMware's vSphere is keeping up with the competition, but the performance numbers weren't dramatic — just very good.

Summary

Describing vSphere 4.0 as a cloud operating system is both a marketing and an ideological product direction change on the part of VMware. VSphere is faster. It manages resources regardless of location, and regardless of where VM clouds are located and abstracts storage as well as VM guest/applications in ways that are currently unique and flexible.

We feel it's more than a simple "dot" release and lays down a gauntlet for Microsoft and the Xen (and Sun's VirtualBox/xVM) communities to work on.

Henderson is principal researcher and Allen is a researcher for ExtremeLabs in Indianapolis. They can be reached at thenderson@extremelabs.com.

■ Go online for a slideshow of what we love/hate about vSphere at: http://tinyurl.com/ncehuz.

New DoS attacks threaten wireless data networks

BY CAROLYN DUFFY MARSAN

NEW YORK CITY — Forget spam, viruses, worms, malware and phishing. These threats are apparently old school when compared with a new class of denial-of-service attacks that threaten wireless data networks.

The latest wireless network threats were outlined in a talk last week by Krishan Sabnani, vice president of networking research at Bell Labs, at the Cyber Infrastructure Protection Conference at City College of New York.

Sabnani said the latest wireless data network threats are the result of inherent weaknesses in Mobile IP, a protocol that uses tunneling and complex network triangulation to allow mobile devices to move freely from one network to another.

"We need to especially monitor the mobile networks — with limited bandwidth and terminal battery — for DoS attacks," Sabnani said.

Sabnani said the newest DoS attacks on wireless networks involve repeatedly establishing and releasing connections. These attacks are easy to launch and hard to detect, he added.

"One cable modem user with 500Kbps upload capacity can attack over 1 million mobile users simultaneously," he said.

Here are five wireless data network threats outlined by Sabnani:

1. **Signaling DoS.** This attack leverages active mobile sessions in the network. It involves sending small amounts of data to re-initiate a session after it has been released. The low-volume attack can create congestion at the radio network controller (RNC). Overload of the RNC results in a DoS for the subscriber.

2. **Battery drain.** This attack also leverages active mobile sessions in the network. It sends packets to a mobile device to prevent the device from going into sleep mode. The attack can involve as little as sending 40 bytes every 10 seconds. This attack wastes radio resources and drains mobile batteries.

3. **Peer-to-peer applications.** Bell Labs found that one subscriber's excessive use of peer-to-peer Web sites was affecting the performance of a North American carrier's 3G network. The subscriber uploaded 1GB and downloaded 3.5GB communicating with 5,000 eDonkey and 37,000 Gnutella sites.

4. **Malfunctioning air card.** The same North American 3G carrier experienced DoS overloads because of a malfunctioning air card. Bell Labs says it took several man-months to identify the rogue device.

5. **Excessive port scanning.** Bell Labs also noted that the same wireless carrier experienced significant wasted air resources from worms and port scans.

Sabnani said Bell Labs' research in DOS threats to wireless networks led to the development of a new product for 3G and 4G wireless carriers called AWARE Detector, a packet inspection engine designed specifically for wireless network architecture and protocols. Alcatel-Lucent is offering the product as the 9900 Wireless Network Guardian. ■

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Apple announcements good but incremental

NET INSIDER
Scott Bradner

Apple's upgrades to its laptop and iPhone product lines last week were no game changers but strengthened already strong offerings. I do wonder if Apple still has something up its sleeve, but it's clear from what also happened last week that AT&T does not.

Being an Apple user is no longer a lonely role. An Apple vice president announced at the company's Apple Worldwide Developers Conference (WWDC) that there are 75 million of us — triple that of two years ago when the first iPhone debuted. It's taken most of that time for the first smartphone products to emerge that actually compete with what Apple showcased in January 2007.

Apple has not stood still, but it is no longer two years ahead, and in some areas is not ahead at all. The lack of multitasking in the soon-to-be-released iPhone software update is quite puzzling.

Apple's upgraded and reduced price laptops are now even more attractive. And the upcoming Mac OSX release with real support for Microsoft Exchange should make the laptops better corporate citizens.

The pre-WWDC meeting pundits were not all that accurate. I did not see any real predictions of the across-the-board updates and price reductions for the Apple laptop line. The few predictions in this space of adding 3G interfaces to laptops were not fulfilled. The iPhone predictions were closer to the mark, but even there the range of memory sizes and features were not that close.

Apple CEO-on-leave Steve Jobs was not a surprise guest and there was no "one more thing" that defined a whole new concept of technology as Apple did with the iPod, iTunes store, iPhone and Appstore in years past. Apple is maintaining that Jobs will be back on at the helm on schedule later this month. It would be a bit of a surprise to me if Apple does hold a special event in the next month or two to reintroduce him and to let Jobs drop another concept changer on the world. Maybe the long predicted Apple tablet.

AT&T has gotten almost as much press since Apple's announcement of the new iPhone and its features as Apple has, but for all the wrong reasons. Apple announced that the iPhone operating system would support multimedia messaging (MMS) and tethering (using the iPhone to connect a computer to the Internet). But AT&T was notably absent from the list of carriers supporting these features. AT&T later said it was only a matter of time before it would support these features — the carrier hinted that it was not technically ready to support MMS but did not even hint at the reason to not immediately support tethering.

Speculation centered on AT&T not yet deciding how much to gouge its customers for the features as being part of the reason for the delay.

AT&T is also getting a lot of bad press for having already decided how much to gouge anyone who wanted to upgrade to the new iPhones. The carrier seems to have an image that its phone subsidy does not get paid off over time but stays constant until a certain date, then goes to zero. In all there seems to be a mole in AT&T who wants to strengthen the argument that federal regulations should be adopted to prohibit carrier lock-in in the United States. Such regulations exist in other parts of the world where iPhones are sold and it does not seem to reduce the enthusiasm. Few people accuse AT&T of looking after its long-term interest, so maybe it is not a mole, but just a short-sighted penny pusher.

Disclaimer: In this economy, penny pushing is even seen at a place like Harvard but I trust it will be not quite so shortsighted. In any case, there is no university opinion on the quality of the new Apple offering or the non-quality of AT&T's, so the above is my opinion.

Bradner is Harvard University's technology security officer. He can be reached at sob@sobco.com.

Building a data center security architecture

SECURITY: RISK AND REWARD
Andreas Antonopoulos

Data center architecture has been changing quite dramatically over the past few years. In many data centers, organic growth had left them broken up into application silos. The standard three-tier architecture was copied for each application leading to a fairly hierarchical network. In this architecture, some core security services, such as firewalls and intrusion prevention, were concentrated at the root of the network tree, closest to the ingress routers and around any DMZs.

Other security appliances, such as SSL accelerators or authentication/authorization systems, might be added to a specific application silo, often as a "temporary" addition or fix. Passive monitoring appliances might also be plugged in to span ports, monitoring traffic at strategic intersections in the network tree. All of those different security systems are now being consolidated, creating a dedicated purpose-built security subnet architecture.

This is not unique to security. We are also seeing similar consolidation in many other network or application services. Optimization devices, caching, load balancing, application gateways, XML gateways and security appliances are often bundled into one "services subnet" that makes the services available to any application in the data center. The strongest driver for this architectural change is the corresponding changes in application architecture. As applications are consolidated and virtualized they often reside in a pool of servers and can be rapidly provisioned anywhere in that pool.

It becomes increasingly harder to point to a specific server and say "that's the CRM". I'm not talking about adaptive or autonomic application shuffling. Even with fairly manual provisioning processes, flexibility and server pooling blur the fixed lines between silos and make things more fluid. So if the applications can be moved around, then the supporting appliances and services also tend to be consolidated and shared.

More companies are discussing consolidation of DMZs and appliances. They are trying to create standardized services subnets primarily to cut costs and reduce complexity. Until recently, the focus has been split between application services and security services. Increasingly however, these functions are converging onto fewer appliances and companies are looking to consolidate them on a single subnet.

Another interesting possibility is the consolidation of passive monitoring systems. Plenty of different passive monitoring systems are scattered around data centers. Whether monitoring performance, network parameters, netflow, security events or applications, these passive devices are competing for limited span ports. Network switches at certain critical intersections in the network quickly run out of span ports or struggle to provide copies of wire-speed traffic to a number of monitor devices. This is likely then to be the next point of architectural consolidation. Along side the active appliance subnet architecture, companies can build a dedicated monitoring architecture that consolidates all the passive appliances in a single location.

As the data center silos break down and the data center network becomes more flat architecturally, we expect to see appliances (both active and passive) consolidated into dedicated services subnets. The architecture of the data center started changing because of server virtualization and consolidation, but the changes are reverberating out. Security is no exception.

Antonopoulos is a senior vice president and founding partner at Nemertes Research, an independent technology research firm. He can be reached at andreas@nemertes.com.

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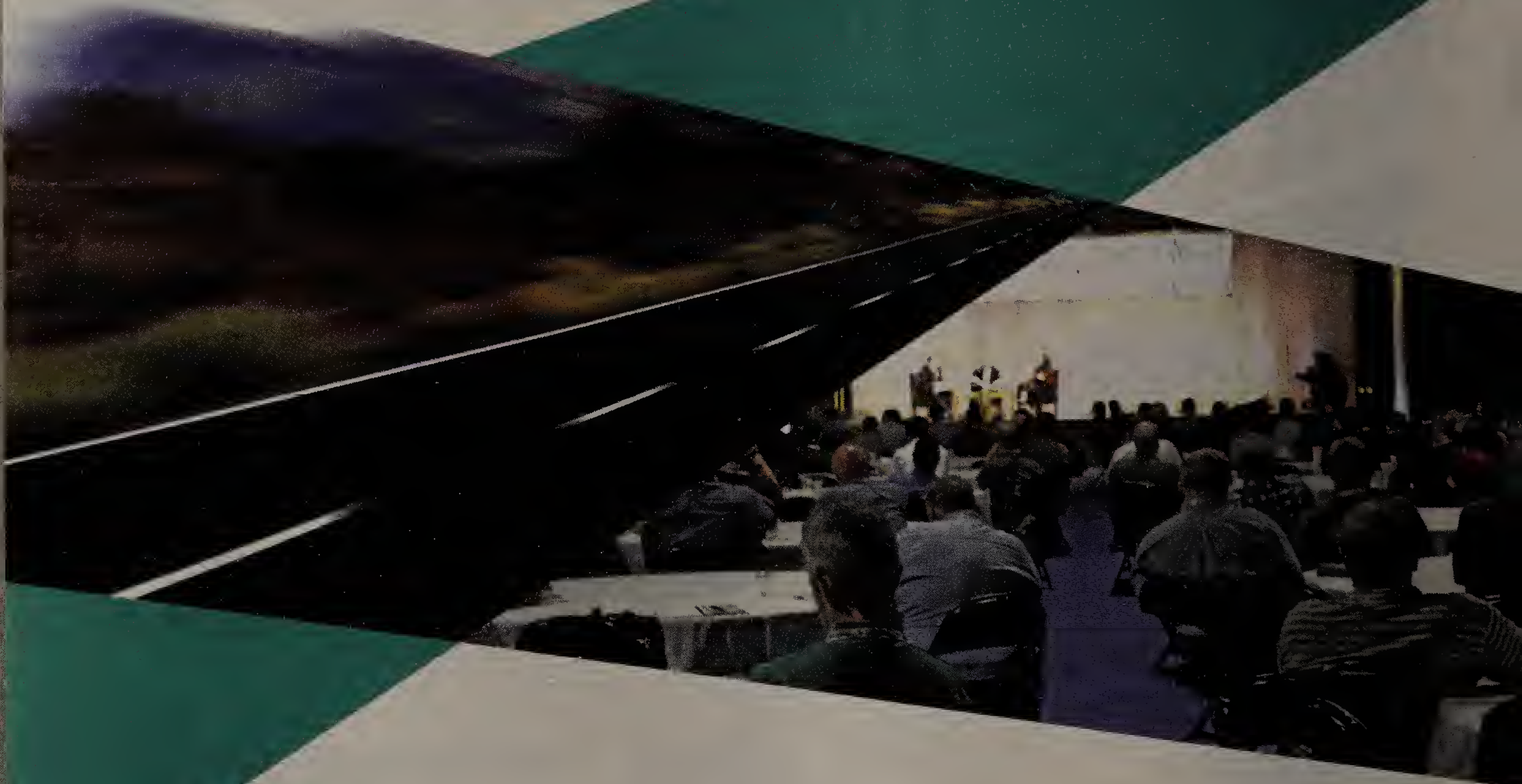

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BY BETH SCHULTZ

DATA CENTER DERBY HEATS UP

■ Network thoroughbred Cisco jumps into the blade server market. Server stallion HP adds security blades to its ProCurve switches. IBM teams up with Brocade. Oracle buys Sun. And everybody courts that prize filly VMware.

In this era of server consolidation and virtualization, green initiatives and cloud computing, the data center is in flux and all the major vendors are jockeying for position, galloping in with new products, strategies and alliances.

"What you see right now is everybody shoring up and getting as many offerings as they can to provide all the hardware in the data center," says Mitchell Ashley, principal consultant with Converging Networks and a *Network World* blogger. Cisco, for example, wants to make it so you can be a complete Cisco shop, including all your servers."

Cisco's blade servers are part of its data center platform, called the Unified Computing System (UCS), which includes storage, network and virtualization resources. Cisco's platform includes VMware's vSphere technology and partnerships with BMC Software, EMC, Intel, Microsoft and Oracle.

But Cisco's entry into the data center fray has kicked up some dust among its longtime server partners HP and IBM, and forced all of the major players to respond in some way. "Cisco has been so successful in the network space, all the other vendors have to take it seriously at the data center level," says Anne Skamarock, a research director at Focus Consulting.

The resultant flurry of activity has included:

- HP releasing the BladeSystem Matrix, a converged software, server, storage and network platform.
- IBM deepening its relationship with Brocade and selling Brocade's Foundry switches and routers under the IBM banner.
- Juniper unveiling Stratus Project, a multiyear undertaking through which it will partner with server, storage and software companies to develop a converged data center fabric.
- Oracle buying Sun for its hardware and software, then grabbing Virtual Iron for its Xen-based hypervisor.

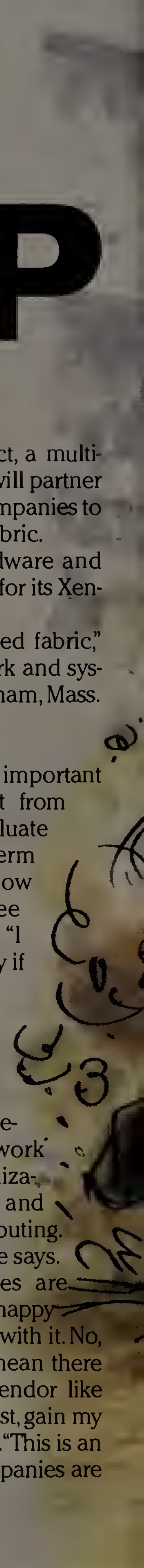
"Everything is pointing to a unified fabric," says John Turner, director of network and systems at Brandeis University in Waltham, Mass.

Decision time for IT execs

"We're in a transition, and it's very important not to just buy who you bought from before. This is a great time to evaluate your vendors, ask about long-term road maps and partnerships, see how integrated they are," says Yankee Group analyst Zeus Kerravala. "I wouldn't make any decisions hastily if I were in IT."

This industry shakeup could also provide an opportunity for some long-shot vendors to make a move on the leaders. Kerravala puts Brocade in this category because of its storage and network strengths, Citrix Systems for virtualization, F5 Networks for networking and Liquid Computing for fabric computing. "These could be the dark horses," he says.

Turner agrees that opportunities are available for the right vendors. "I'm happy with my Cisco network. I'm thrilled with it. No, I'm wowed by it. But that doesn't mean there isn't an opportunity for another vendor like Juniper to come in, pique my interest, gain my respect and get in here," Turner says. "This is an opportunity to take a big leap. Companies are going to be doing big refreshes."



THE RACE IS ON

Virtualization. Consolidation. Automation. Private clouds. Green computing. It's all happening in the data center, where the industry's leading vendors are jockeying for position. Here's how the field shapes up:

FRONTRUNNERS

1. HP (2-1)
2. Cisco (5-2)
3. IBM (3-1)
4. VMware (4-1)

CHALLENGERS

5. Oracle (6-1)
6. Microsoft (8-1)

LONGSHOTS

7. Brocade (11-1)
8. Juniper (12-1)
9. Liquid Computing (15-1)
10. Novell (17-1)

COVER ILLUSTRATION: DAN VASCONCELLOS

Handicapping the crowded field, from the odds-on favorites to the long shots.

These changing times for IT infrastructure require an open mind, says Philip Buckley-Mellor, a designer with BT Vision, a provider of digital TV service in London. Yet Buckley-Mellor admits he can't imagine BT Vision's future data center without HP at the core.

By year-end, Buckley-Mellor expects most of Vision's data center operations to run on HP's latest blades, the Intel Nehalem multicore processor-based G6 servers. The infrastructure will be virtualized using VMware as needed. HP's Virtual Connect, a BladeSystem management tool, is an imperative.

"The ability to use Virtual Connect to re-patch our resources with networks and storage live, without impacting any other service, without having to send guys out to site, without having the risk of broken fibers, has shaved at least 50%, and potentially 60% to 70%, off the time it takes to deploy a new server or change the configuration of existing servers," Buckley-Mellor says.

Within another year or so, he expects Vision to move to a Matrix-like orchestrated provisioning system. The HP BladeSystem Matrix, which HP introduced in April, packages and integrates servers, networking, storage, software infrastructure and orchestration in a single platform.

"We already have most of the Matrix pieces...so orchestrating new servers into place is the next logical step," Buckley-Mellor says.

Place your wagers

Gartner analyst George Weiss says Cisco and HP unified compute platforms run pretty much neck and neck. However, IBM — HP's traditional blade nemesis in the data center — has more work to do in creating the fabric over which the resources are assembled, he adds.

"IBM can do storage, and the server component in blades, and the networking part through Cisco or Brocade, so from a user perspective, it seems a fairly integrated type of architecture. But it's not as componentized as what Cisco and HP have," Weiss says.

"But with Virtual Connect and networking solutions like ProCurve [switches], and virtualization software, virtualization management, blade-based architecture, all of the elements Cisco is delivering are within HP's grasp and to a large extent HP already delivers. It may not be everything, but there may be things HP delivers that Cisco doesn't, like a command of storage management," he explains.

Buckley-Mellor sees one technology area in which Cisco is a step ahead of HP — converged networking, a la Fibre Channel over Ethernet (FCoE). Cisco's Nexus 7000 data center switch will support this ANSI protocol for converging storage and networking later this year and the UCS will feature FCoE interconnect switches.

"There are no two ways about it; we're very interested in converged networking," Buckley-Mellor says. Still, he's not too worried. "That technology needs to mature and I'm sure HP will be there with a stable product at the right time for us. In the meantime, Virtual Connect works great and saves me an ocean of time."

All this is not to say that Cisco and HP are the only horses in the race. But they, as well as companies such as IBM and Microsoft will have leads because they already have deep customer relationships.

"IT organizations will look to vendors for their strategies and determine how they'll utilize those capabilities vs. going out and exploring everything on the market and figuring out what new things they'll try and which they'll buy," Ashley says.

Cover your bets

In planning for their next-generation data centers, IT executives should minimize the number of vendors they'll be working with. At the same time, it's unrealistic to not consider a multivendor approach from the get-go, says Andreas Antonopoulos, an analyst with Nemertes Research.

"They'll never be able to reduce everything down to one vendor, so unless they've got a multivendor strategy for integration, they're going to end up with all these distinct islands, and that will limit flexibility," he says. He espouses viewing the new data center in terms of orchestration, not integration.

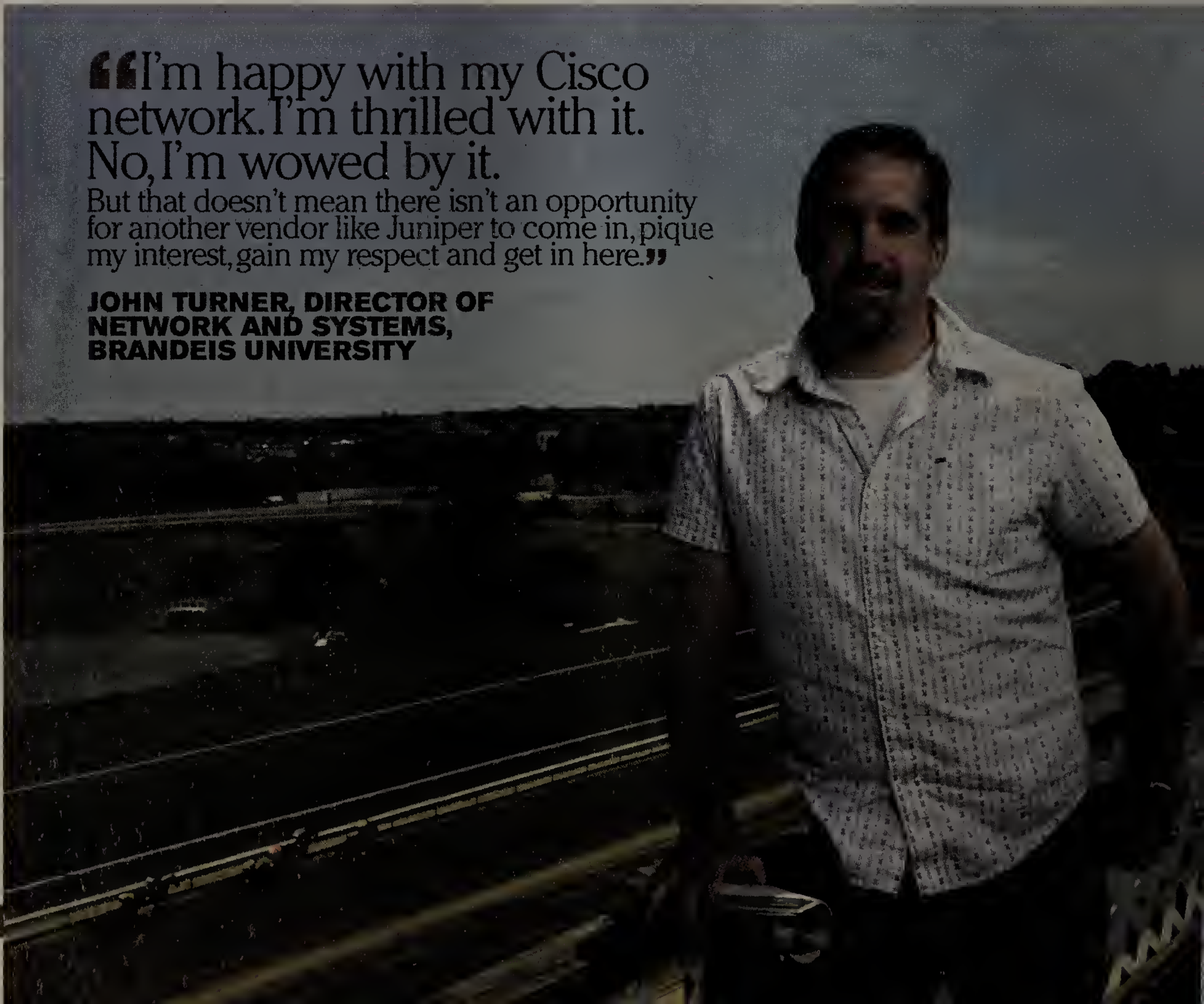
"Because we'll have these massive dependencies among servers, network and storage, we need to make sure we can run these as systems and not individual elements. We have to be able to coordinate activities, like provisioning and scaling, across the three domains. We have to keep them operating together to achieve business goals," Antonopoulos says.

From that perspective, a unified compute-network-storage platform makes sense — one way to get orchestration is to have as many resources as possible from a single vendor, he says. "Problem is, you can only achieve that within small islands of IT or at small IT organizations. Once you get to a dozen or more servers, chances are even if you bought them at the same time from the same vendor, they'll have some differences," he adds.

Skamarock equates these emerging unified data center platforms to the mainframes of old. "With the mainframe, IT had control over just about every component. That kind of control lets you do and make assumptions that you can't when you have a more distributed, multi-vendor environment."

That means every vendor in this race needs to continue to build partnerships and build out their ecosystems, especially in the management arena.

Here's a look at the crowded field.



> "I'm happy with my Cisco network. I'm thrilled with it. No, I'm wowed by it.
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>
> **JOHN TURNER, DIRECTOR OF NETWORK AND SYSTEMS, BRANDEIS UNIVERSITY**

DATA CENTER DERBY 2009

A look at the crowded field.

FRONTRUNNERS

1

COMPANY: HP

ENTRY: BladeSystem Matrix

MORNING LINE: 2-1

TIP SHEET: Has the inside track with the most comprehensive data center portfolio

HP clearly does not intend to let Cisco usurp its position in the data center.

After Cisco unveiled its Unified Computing System (UCS), HP quickly countered with BladeSystem Matrix, which it calls "a plug-in adaptive infrastructure" for managing physical and virtual data center resources. BladeSystem Matrix is the first big thunderclap resulting from a three-year development program, says Jim Ganthier, vice president of marketing for infrastructure, software and blades.

First came HP's c-Class server blades, introduced in 2006, which now boast nearly 60% market share. Then came Virtual Connect, a virtualized interconnection for those blades; Virtual Connect Flex-10 Ethernet, a module for distributing 10Gigabit Ethernet over four connections; and Insight Dynamics - VSE, a systems manager for physical and virtual servers

Besides these elements, BladeSystem Matrix includes HP StorageWorks' arrays and Fibre Channel interconnects. HP has also added security blades to its ProCurve switches, a clear shot across the bow aimed at Cisco.

"A lot of companies will look at the data center as expertise in networking, compute or storage and may build a loose federation or confederation of multiple partners to try pulling all the resources together," Ganthier says, clearly alluding to Cisco. "What makes us different ... is that we take a systematic view in the data center. We have everything in the HP portfolio."

Philip Buckley-Mellor, a designer with BT Vision, a London-based provider of digital TV service, likes that approach.

The company already uses most of the Matrix, excluding Insight Dynamics - VSE, which Buckley-Mellor says is the next logical step for server orchestration across a unified fabric.

"Our internal processes won't move as fast as HP is with its software, but it's nice to know it'll be there ready when we are and that we'll save a lot of time and money on management," he says.

But HP's singularity could be a bad thing for others, analysts note. "Simplicity is good, but nobody wants to be locked in to a single vendor in the data center," says Ann Skamarock, a research director at Focus Consulting.

2

COMPANY: Cisco

ENTRY: Unified Computing System

MORNING LINE: 5-2

TIP SHEET: Networking stud goes for the brass ring with new products, partnerships

Cisco shook up the data center world in February when it announced its vision of a fully automated, consolidated and virtualized next-generation data center. Core to this pre-integrated platform are Cisco's new homegrown blade servers, based on Intel's next-generation Nehalem multicore processors.

Each blade server uses network adapters for access to the system's unified fabric, built using lossless 10Gbps Ethernet and Fibre Channel over Ethernet interconnect switches. A blade chassis supports as many as eight blade servers and two fabric extenders, providing as many as four 10G connections each between blade servers and the fabric interconnect. UCS Manager, embedded management software, integrates system components and provides centralized management.

"UCS is really all about virtualization, consolidation and automation," says Soni Jiandani, vice president of marketing for Cisco's Server Access and Virtualization Group. And it's about standardization, she adds.

"We believe that with consolidation comes capex and opex reductions. But without embedded virtualization and management capabilities, it is a half-fulfilled promise," Jiandani says. "The ultimate promise is that the customer should be given the ability to integrate technologies already deployed without disrupting what they have in place, in terms of operational model and technology investments in systems management, networking, applications, hypervisors and operating system."

Hence, she says, Cisco developed the UCS to integrate with the technologies offered by a slew of ecosystem partners, including BMC Software, Intel, Microsoft, NetApp, Oracle and VMware. Industry watchers consider the management partnership with BMC particularly important.

With BMC management tools, Cisco gains the ability to provision, configure and manage the UCS in an integrated way. BMC BladeLogic, integrated with the UCS Manager software, will enable automated provisioning and configuration of the system resources.

Cisco's move into blade servers may upset HP and IBM, but it's a logical step, according to Zeus Kerravala, a senior vice president at Yankee Group Research. "As the coupling of compute and networking come together, Cisco needs to change its partnerships and look to applications and even storage to some extent. The Cisco-EMC-Oracle ecosystem is the thing that will be as important to Cisco over the next 10 years as HP and IBM were the last 10 years."

PHOTO: TRACY POWELL, ILLUSTRATION: DAN VASCONCELLOS

3

COMPANY: IBM

ENTRY: IBM/Brocade/Juniper

MORNING LINE: 3-1

TIP SHEET: Will try to ride strong service component to the winner's circle

Ask IBM about the next-generation data center and company officials will begin talking about the dynamic infrastructure and how it is forever expanding outward as enterprises embrace mobility and increase the numbers and types of devices in use.

IBM is pulling together the server, storage and networking resources needed to support this expanding infrastructure, then topping that off with software for managing the environment. Virtualization across the entire infrastructure, meaning all classes of servers, storage, networking and applications, is a critically important enabling technology, and energy management an underpinning as well, describes Pete McCaffrey, director in IBM System and Technology Group.

If that doesn't sound so different from what Cisco and HP have planned, that's because it isn't. But IBM does talk up its services capabilities more than the others. For example, McCaffrey touts the recently introduced IBM Service Management Industry Solutions, which pull together various service management services and software from IBM and its partners, to help organizations centrally manage their expanding infrastructures. He also pitches a new networking service aimed at helping enterprises with consolidation and virtualization.

"Our clients aren't only looking for technologies. They're also coming to us and saying, 'How do I move forward?'" McCaffrey says.

The Brocade/Juniper connection

Some of IBM's more intriguing moves are networking-related, industry watchers say.

Although IBM officially says it is not backing away from Cisco as a strategic partner, the company has decided to put its label on and resell Ethernet gear from Brocade, and it is collaborating with Juniper Networks on hybrid public-private cloud capabilities.

That IBM is rebranding the Brocade switches and routers is telling about how frayed the Cisco relationship may be, says Zeus Kerravala, a senior vice president at Yankee Group. "That kind of move is more common in IT, not networking," he says.

On the compute side, IBM needs to do more work than either Cisco or HP in terms of creating the fabric over which the myriad resources are assembled, says George Weiss, a vice president and distinguished analyst with Gartner.

"It can do storage, and the server components in blades, and outboard the networking part, so it does deliver a fairly integrated type of architecture. But it's not as componentized and virtualized as what Cisco or HP are doing," he says.

If IBM can't compete on an architectural plane in the same ways the competition appears to be delivering benefits and ROI, then it could lose opportunities and market share, Weiss says.

Kerravala gives the nod to HP as having a bit of an advantage over IBM. "HP seems to have been thinking about this longer than IBM," he says. "IBM seems to be in a bit of reactionary mode."

But IBM stands by its looser architectural approach. "A one-size systems approach isn't going to work in this world," McCaffrey says. "We will continue to invest in different systems and platforms that are optimized to perform certain types of work, and we'll do this in a way that allows us to deliver a level of choice with special-purpose processing but still be manageable in a common, integrated fashion."

4

COMPANY: VMware

ENTRY: vSphere

MORNING LINE: 4-1

TIP SHEET: Virtualization frontrunner, part of EMC stable

If you're visualizing the next-generation data center, 100% virtualized, then VMware more than likely fits into the picture.

The company has taken the idea of a fully virtualized data center to a new level with the latest release of its core virtualization platform, vSphere 4. The company describes vSphere 4, an update from Virtual Infrastructure 3, as a cloud operating system that will let enterprises centrally manage servers, storage and networks as if one big resource.

With this platform, VMware's core hypervisor should be able to handle large databases and other more demanding applications. vSphere quadruples the amount of memory available to virtual machines (VM), triples network throughput and doubles the maximum I/O operations to more than 200,000 per second, the company says.

"With Vsphere, customers are realizing they can virtualize every application. And if you can virtualize every application, then you can build a data center model assuming a virtualization layer on top. This doesn't just span one use case, like test and dev, it's something that is a baseline of capabilities that straddle the entire data center," says Chad Sakac, vice president of the VMware Technology Alliance at EMC.

Toward that end, VMware has worked with Cisco and EMC for deep integration of vSphere and the networking and storage infrastructures, respectively. In effect, the result is a network, server and storage infrastructure that is effectively invisible, Sakac says.

From a storage/backup perspective, vSphere includes three new features: VMware Fault Tolerance, which creates a live replica of an application on a different server that can be used in the event of a hardware failure; vStorage Thin Provisioning, which allows less physical storage to be allocated to a VM; and Distributed Power Management, which can consolidate virtual machines onto fewer machines during periods of low usage.

"You wouldn't provision a bunch of terabytes, fill those, and then add more. ... All you do is provision VMs, and you say, 'This one is low priority and this one high. This one is going to get this amount of megabytes per second, and this one that amount. This one I want to replicate off site, and this one I don't care.' You create [service-level agreements] at the VMware layer and they'd automatically by applied at the storage layer," Sakac says.

EMC adds storage dimension

With this type of fluidity in mind, EMC is rethinking its storage strategy top to bottom. For example, it recently redesigned its flagship array, the Symmetrix, Sakac says. The new array, called the Symmetrix V-Max, comprises industry standard components assembled into building blocks, each with their own cache memory and I/O. The building blocks perform as a single, virtualized array.

"We started first with V-Max, but with all of our platforms we'll automatically be able to move where the data lives to be able to deliver more or less performance without the administrator needing to do anything," Sakac says.

Although EMC doesn't often get recognition as a management vendor, the company's management strategy can't be underplayed in the next-generation center, either, Sakac notes. All of its management tools, including ControlCenter for storage and Smarts for networking and application dependency mapping, are integrated not only into the EMC infrastructure but also into VMware's vCenter Server (formerly VirtualCenter) management platform. In addition, Smarts is integrated into the Cisco UCS, Sakac says.

"EMC, VMware and Cisco share a common vision," he adds, noting however that EMC also has partnerships with other next-generation data center players such as Dell and Microsoft.

See Digital Derby, page 32

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CHALLENGERS

5

COMPANY: Oracle

ENTRY: Oracle-Sun-Virtual Iron

MORNING LINE: 6-1

TIP SHEET: Late entry with strong bloodlines. Never bet against Larry Ellison down the stretch

Two months ago, Oracle wouldn't have leapt to mind as a potential contender in the next-generation data center. But that was pre-Sun, pre-Virtual Iron. Now, all of a sudden, Oracle has an interesting data center story to tell.

Mitchell Ashley, a principal consultant with Converging Networks, said in a recent blog post that the Sun acquisition is about "taking Sun's loosely banded software strategy and honing it into a strategically aligned set of weapons against Microsoft."

He added, "Oracle now has ownership of the full and complete software stack, from OpenSolaris, up through Java, right up to key enterprise apps. Oracle is now in control of its software destiny, but much of it open source with OpenSolaris and MySQL, plus Java (at least considered non-proprietary), like Microsoft has had with its proprietary Windows, SQL Server, .Net. I believe Ellison's squaring off to deliver the biggest blow to Microsoft he can, once and for all."

But whether you choose to cast Oracle's move as a mano a mano between Ellison and his archenemies in Redmond or something less personal, Oracle also has ownership of some solid virtualization technology that it can use to supplement Oracle VM, its Xen-based server virtualization software.

Sun has a full virtualization suite, covering desktops, servers and storage. Plus, it's done some nifty development on its virtualization management software, Sun xVM Ops Center, that enables it to do full data center management, Ashley says. "The Virtual Iron purchase on top of this tells me that Oracle is taking more of a virtualization play into the data center as opposed to just a hardware play."

Virtual Iron's server virtualization management platform will become part of the Oracle VM and Oracle Enterprise Manager product lines. The goal will be helping customers optimize capacity utilization with more dynamic resource management; reduce server power consumption with automated power management tools; and provide deeper insight into server performance and utilization at every layer, the company says.

Ultimately, Oracle could be gunning for the day when the operating system isn't so important anymore, suggests John Turner, director of network and systems at Brandeis University in Waltham, Mass.

"If I'm an Oracle, and I want to deploy a new installation of PeopleSoft applications in a high-volume area, and I look at the number of support calls that would come in, and the upgrade costs, I'd like to think about deploying a virtual application in a cloud without worrying about the operating system, storage and the network," Turner says. "We'd really start to think more about deploying the application and less about the engineering behind it."

6

COMPANY: Microsoft

ENTRY: Hyper-V

MORNING LINE: 8-1

TIP SHEET: Desktop dominance doesn't automatically translate onto a faster track

Microsoft's next-generation data center strategy is simple: Make virtualization ubiquitous.

Virtualization needs to be the default in the data center, for tactical and strategic reasons – server consolidation, power savings, fluidity of moving data between machines and even data centers, says David Greschler, director of Microsoft's integrated virtualization strategy.

Making it so, Microsoft-style, means making virtualization easy to get. That it has done in two ways. It has integrated virtualization into the operating system, making its Hyper-V hypervisor a component of Windows Server 2008. And, for those enterprises not yet ready for Windows Server 2008, it offers a free hypervisor, Hyper-V Server 2008.

Microsoft's integration strategy was a big boon to MLS Property Information Network (PIN), a prominent multiple listing service in New England, says Matt Lavallee, directory of technology at the Shrewsbury, Mass., company.

"We knew virtualization was the answer for us because of our capacity bubbling ... and it would a very compelling problem for us not to have gone with Hyper-V," he says

Especially important was the training component, Lavallee says.

"We did an early cost evaluation between Hyper-V and VMware ESX Server with VirtualCenter. With ESX, we had to add in costs for training – if it's new to your environment and you're deploying a six-figure toolset, you have to have the training and implicit knowledge that goes with that," says Lavallee, noting that at the time the VMware solution would have cost $160,000 vs. nothing for Hyper-V, because MLS PIN already had its Windows Server 2008 licenses in place with unlimited node capacity.

MLS PIN has consolidated 60 standalone servers down to 20 clustered servers running Hyper-V. Next up will be virtualizing storage and then bringing in the networking piece, Lavallee says.

For Microsoft, making ubiquitous virtualization feasible also means managing the whole thing end to end, Greschler adds. From a Microsoft System Center console, that means being able to manage the physical and VMs, including hypervisors from other vendors. "The hypervisor gives you the foundation, but it's the management that lets you unlock the value," he adds.

Next Microsoft would like to be able to take this flexibility and extend outward, enabling enterprises to move workloads among data centers that are either their own or rented compute power. "This represents a whole new set of challenges, including directory, compliance, security, provisioning – and nobody has the answer today, not Microsoft, not VMware," Greschler says.

But Microsoft is working toward this IT-as-a-service end, he adds, not only through Hyper-V and System Center, but with its cloud offering, Azure.

LONGSHOTS

7

COMPANY: Brocade

ENTRY: FCoE/CEE

MORNING LINE: 11-1

TIP SHEET: Well positioned with emerging technologies, but won't hit stride for another year or two

Brocade is a networking company, nothing more, nothing less. "We don't make phones, we don't make servers, we don't build furniture," says Dave Stevens, the company's CTO.

That means two things for Brocade's approach to the next-generation data center.

The first is continued work on key emerging networking technologies, including Fibre Channel over Ethernet (FCoE), which allows convergence of storage and networking over a single 10Gbps pipe, and Converged Enhanced Ethernet (CEE), Stevens says. CEE is an extended version of Ethernet that will support data center applications. It is a lossless technology, which is necessary for moving Fibre Channel over an Ethernet infrastructure.

FCoE and CEE aren't widely embraced

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Marc Shpilner, President and CEO

LIMOUSINE EIGHTEEN LTD.

Shpilner is the founder of Limousine Eighteen, a global ground transportation company dedicated to keeping clients around the world "on the move."

Limousine Eighteen is up against some stiff competition. But Marc Shpilner says his Burlington, Mass.-based company can do anything the big guys can do because of his unified communications platform.

In this tough economy, how does Limousine Eighteen stay competitive?

Ground transportation is a highly competitive business, and Limousine Eighteen is a small company facing some fairly big players. But our stand-out customer service keeps us ahead of the game. All that starts with empowering top-notch employees with exceptional tools so we can respond to customer needs 24/7, 365 days a year. If we can't do that, we can't compete.

How does unified communications help achieve that advantage?

Unified communications gives us the flexibility we need to attract and keep exceptional talent—even if they have to work remotely. Someone may need to work out of state for family reasons, while someone else works from home during maternity leave. With a limited local resource pool, we can't turn those folks away.

All of our employees need to be productive and responsive no matter where they are. That includes when they're running between a limo and their office or stuck at home during a snowstorm. Unified communications gives them that mobility with headquarters-level communications tools.

Why was investing in your communications infrastructure so important?

For starters, we needed a complete upgrade for remote access so that we could attract the best employees and arm them with the tools they needed to work effectively from anywhere. We also needed to handle increased customer call volumes. And a new infrastructure enabled us to deploy the necessary call-management capabilities—like group calling, routing, and even recording—to deliver on growing service expectations. Our old technology didn't provide for even half those things.

Why was Avaya's unified communications solution the right choice for Limousine Eighteen?

Working with our technology partner, All Business Communications (ABC), we implemented Avaya's IP Office Platform, and it has allowed us to do things that some of the biggest players in our industry are still unable to do. We're not like one of those big airlines—our customer calls are never queued. We never miss a call or a reservation. If an agent isn't available, calls are automatically escalated to a manager. And if an agent is on the move, his calls are automatically forwarded to his cell phone and then back to his desk phone without the caller ever knowing.

ABC has really had its thumb on what the Avaya platform could do for our business.

How has unified communications affected your business and your customers?

I think the greatest impact it's had is on our ability to hire great people who don't have to be in the office. An agent living out of state can do exactly what we do within these four walls. And with the call-management features, the customer experience has been enhanced significantly. We've even seen cost benefits in that we've cut down on our office footprint. In fact, our next renewal of office space will be dramatically reduced— and that's money we can put back into the business.

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Digital Derby continued from page 34

by enterprises, but that is expected to change as the standards gel, products mature and next-generation data center plans solidify. With an eye on that day, the company recently introduced two converged network adapters and a top-of-the-rack FCoE switch. They replace Fibre Channel host bus and Gigabit Ethernet adapters in servers and provide connectivity to both networks via a combination of Fibre Channel and lossless CEE.

The second is continued tight integration of the Brocade networking products with partners' compute, management and storage technologies, Stevens says. Here Brocade's acquisition of Foundry is paying off, as IBM will be rebranding and reselling those switches and routers as part of its dynamic infrastructure offerings. This extends a decade-old, storage-related partnership between the two vendors, and suggests the growing importance of networking connectivity across the data center.

Brocade's expertise across storage and now Ethernet networks gives it an excellent chance at gaining share as the next-generation data center evolves, says Zeus Kerravala, a senior vice president at Yankee Group.

8

COMPANY: Juniper

ENTRY: Stratus Project

MORNING LINE: 12-1

TIP SHEET: Promising late entry, needs more seasoning

Juniper Networks doesn't intend to let enterprise switch nemesis Cisco take the next-generation data center race unchallenged. So to Cisco's UCS, Juniper ponies up the Stratus Project.

Through Stratus, Juniper intends to provide a converged data center fabric, says Andy Ingram, vice president of product marketing and business development for the company's Data Center Business Group. It will provide the networking and security pieces, while partnering for compute, storage and software. One of those partners presumably would be IBM, which Juniper has teamed with for work on cloud computing.

Juniper's fabric contributions will include a converged Ethernet/Fibre Channel switching interconnect, multiple security services, WAN acceleration and routing. The goal, Ingram says, is to provide connectivity and security services for applications within a data center, between data centers and into the cloud.

Juniper also intends on providing the management services to provision, update, configure, monitor and repair the network and security elements and to cooperate with the overall data center management software, Ingram says.

That Juniper's business model "is not predicated on prolonging legacy information infrastructures" will provide the company a competitive edge, Ingram says. "We are free to rethink the data center network architecture and deliver ... a network in the data center that is simpler, faster, more reliable, more environmentally friendly and more economical than other vendors. The simplicity is inherent to the innovative architecture vs. being hidden and camouflaged by abstractions layered on a legacy architecture," he says.

Still, Juniper is a bit of a long shot, says Anne Skamarock, a research director at Focus Consulting.

"Yes, of course, Juniper can [present a unified data center strategy]. But will it be successful?" Skamarock asks. "Cisco may have a chance of pulling this off because it's essentially been doing specialized computing for years and it has a huge market leadership that gives it access at the executive level to a lot of these data centers. For a smaller company or dark horse to come in at this point it would have to do something incredibly compelling and very different from what Cisco and other bigger players have today."

9

COMPANY: Liquid Computing

ENTRY: Liquid IQ

MORNING LINE: 15-1

TIP SHEET: Fast out of the starting gate, but may have trouble staying with the big boys

When Cisco unveiled its Unified Computing System in February, the news had some perhaps unintended consequences. It lent legitimacy to a group of small specialty vendors offering unified data center platforms.

One such company is Liquid Computing, which offers a "data center in a box" blade system it calls LiquidIQ. In this converged system, server, network, storage and operating system, and associated physical and virtual connections, are represented as logical components manageable via a LiquidIQ interface or through existing management systems, the company says.

Liquid Computing, which formed in 2003, has built up an ecosystem of partners around its technology. For example, LiquidIQ supports Microsoft Windows Server 2008, the Hyper-V hypervisor and Microsoft System Center management capabilities. Other partners include VMware, Oracle, NetApp and Novell, for enterprise Linux support.

Liquid Computing has a first-mover advantage with its unified data center concept, having had time to build up a multi-sourcing capability and community effort around its core technology. Those are must-haves for any start-up pushing against legacy vendors, says George Weiss, a vice president and distinguished analyst with Gartner.

However, now that big, established players such as Cisco and HP are racing ahead with unified fabric architectures, Liquid Computing and others of its ilk may have trouble in the enterprise, Weiss suggests. "Some data centers won't take the risk on the longevity and survivability of a start-up," he says.

10

COMPANY: Novell

ENTRY: Service-Driven Data Center

MORNING LINE: 17-1

TIP SHEET: Son of NetWare jockeys for position as open source alternative

Novell most likely wouldn't be the first bet placed in the data center race, but the company has been amassing essential technologies and developing a comprehensive next-generation strategy that might make for a surprising finish.

Novell's data center portfolio includes SUSE Linux enterprise software, PlateSpin virtualization and workload management tools and, with the recent Managed Objects acquisition, business service management.

It will use these technologies to deliver on its data center vision, which it calls Service-Driven Data Center, says Richard Whitehead, the company's director of marketing for data center solutions.

"The Service-Driven Data Center provides solutions to build, manage and measure the next-generation data center, so IT executives can deliver the business services that end users need through a flexible, automated and cost-effective infrastructure," he says.

As is expected from an enterprise Linux provider, openness, interoperability and ease of use are themes for Novell in the data center. "We take the 'Switzerland' approach," Whitehead says. "We recognize that our customers will want to leverage their existing data center investments and may want to work with other partners."

Schultz is a freelance writer in Chicago. She can be reached at bschultz5824@gmail.com

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Distributed traffic capture options

BY TERENCE BRESLIN

Visibility can be the critical factor in heading off the increasing number of attacks, outages and data breaches in large-scale distributed networks. But up to now total visibility of Ethernet networks has been infeasible because of the cost of deploying analytical devices throughout the network. Distributed traffic capture is a new approach to network monitoring that can deliver complete, selectable and centralized visibility.

Currently network traffic is monitored locally, using SPAN ports and/or inline taps. SPAN ports tend to drop packets at random when the switch is loaded, and many shops don't have enough available SPAN ports for even minimal monitoring coverage. Inline network taps are a direct way to capture traffic but they have traditionally lacked the selective aggregation, filtering capabilities, distributed management features and range of port densities necessary to make them anything more than a standalone solution.

With no way to get a centralized view over a LAN down to Layer 2, service-level agreements for real-time applications such as video and financial trades cannot be assured and enterprises cannot comply with regulations requiring a complete copy of transactions and lawful intercepts. This situation is exacerbated by the need to use existing gigabit monitoring infrastructure even as 10-Gigabit switches continue to be rolled out at the core and access layers.

Much of the focus on network monitoring has been at the application layer. In part this is because monitoring equipment has become more capable and specialized, able to identify more events and correlate diverse data sets into actionable reports. But the equipment does not provide visibility into all parts of the network from a central location, leaving segments of the network unmonitored and the monitoring equipment's capacity either underutilized or oversubscribed.

Distributed traffic capture involves deploying capture devices across the network as a unified system, linking network infrastructure to analytical equipment. In this way traffic capture closely meshes with network topology, collecting a copy of traffic at any point and sending it in real time to centralized monitoring tools.

In large, distributed Ethernet networks, monitoring equipment sits atop a best-effort delivery IP infrastructure. With the rapidly increasing presence of time-sensitive high-bandwidth traffic running at 10-gigabit over IP, network professionals have begun to apply traffic engineering principles to network design. One example is the adoption of traffic management protocols, such as MPLS, widely used as the basis for VPNs.

Likewise, engineers are beginning to take a traffic engineering approach to network monitoring: employing distributed traffic capture as a system matched to the network. The capabilities of the traffic capture devices are determined by the speeds, nature of traffic and their location in the network's core, distribution, access and/or gateway layers and, if applicable, related telecom architectures.

A layered approach to traffic capture

A traffic capture system is comprised of two layers: 1) inline or SPAN port capture-aggregation, and 2) aggregation-distribution to the monitoring equipment. This design enables flexibility in terms of where the capture points are located and provides for scalability. The system collects the copied traffic at a few or hundreds of capture points anywhere on the network, grooms it and then forwards it to centralized analytical and monitoring devices.

Grooming operations occur in real time and solely in hardware, typically resulting in an average propagation delay of two packets or less. The copied traffic may be selectively aggregated, filtered on Layers 2 to 4 depending on the types of analytical devices to which it is going, load balanced to ensure that the monitoring equipment is not oversubscribed, and sent to a centralized location.

A key element to the traffic capture system's scalability is an interface, preferably graphical, that lets users create filter settings and securely manage capture devices from one location.

The design of a distributed traffic capture system is based on the requirements of the monitoring devices. Commonly used monitoring equipment are: intrusion detection/prevention systems, performance monitors, service assurance tools and data recording devices. Each of these devices may need to see only certain slices of traffic — such as HTTP, voice, video, signaling, virtual LAN data and/or payload — and from only selected network segments or the entire network.

Design criteria that network engineers should take into account include:

- The number of networks being monitored.
- The media (copper, fiber or mixed).
- The location and number of capture points, whether SPAN ports or inline.
- The speed for each link associated with a capture point.
- The type and volume of traffic.
- The performance capability/bandwidth of the analytical equipment and its location.
- Available rack space.

The most efficient design process for a distributed traffic capture system usually follows these steps:

1) Determine the traffic the monitoring tools must see.

2) Identify the traffic capture points.

3) Map the capture points to the best combination of port densities, speeds and grooming capabilities of the traffic capture device.

4) At the traffic capture distribution layer, configure the monitor output ports to send traffic customized for reach monitoring device.

Implementation criteria for traffic capture devices are generally straightforward. One that's not is how the device handles gigabit failover on copper media. Network engineers designing a system should ensure that the device will fail over quickly enough, typically less than 100 milliseconds, to avoid link loss.

Traffic capture devices are typically set and forgotten. But if you think that yours may one day be redeployed, look for maximum flexibility, such as configurable I/O ports, inline as well as SPAN capture, and the ability to download firmware to add functionality. Further, the system should allow the addition of similar interoperable devices that add capture points and analytics interfaces as needed.

The key to effective monitoring is being able to scale a growing number of analytics systems across a growing number of capture points. The emergence of today's traffic capture devices with onboard intelligence for complex traffic grooming allows their deployment as a system for total monitoring and security coverage, while at the same time reducing deployment costs and achieving a higher ROI for the analytics tools of choice.

Monitoring professionals are effectively awakening to a new era of network monitoring where the old paradigm of rigid cost-laden architectures has given way to a layered and scalable system of total visibility and hardware driven efficiency.

Breslin is CEO and founder of VSS Monitoring.

This vendor-written tech primer has been edited by Network World to eliminate product promotion, but readers should note it will likely favor the submitter's approach.

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Building an RSS Podcast Feed, Part 2

Last week we discussed the nuts and bolts of using RSS (Really Simple Syndication) for publishing a podcast, and we also looked at a service that generates a first pass at generating RSS feeds.

So, let's assume that you have recorded your podcast, probably in WAV format. Before you do anything else you absolutely have to use The Levelator. Published for free by The Conversations Network (TCN), a nonprofit organization set up to help "people capture, produce, preserve, find and share recordings of spoken-word events", the Levelator adjusts the audio levels within a file to correct for audio variations from one speaker to another.

This TCN claim is true: "The Ul is dirt-simple: Drag-and-drop any WAV or AIFF file onto The Leveler's application window, and a few moments later you'll find a new version which just sounds better." The Levelator runs on Windows, OS X (universal binary), or Linux (Ubuntu) and l award it a rating of 5 out of 5.

Now that you have a leveled file you're going to need to transcode it to another format. While there are a number of formats you could use, MP3 is pretty much the gold standard when it comes to a format that most playback systems can handle.

As most corporate podcasting will be primarily people talking, you can use a sampling rate as low as 22kHz at a bit rate of 48Kbps. Speech with some music (more than incidental intro and outro music) or just high-quality speech should be sampled at 44.1kHz at bit rate of anything from 64K to 96Kbps, while a podcast that is mostly music would ideally be recorded at 44.kHz with a bit rate between 128K and 192Kbps.

That said, the best choice for the sampling rate will be a variable bit rate, which usually produces better sound quality than a podcast recorded at a constant bit rate but with a slightly large file size.

Now we come to decisions about the RSS feed we're going to create. One of these is whether we're going to provide a "truncated" feed or a "full" feed of the text accompanying our podcast. The value of this text is directly related to the degree to which you feel the podcast needs explaining and/or promotion.

In a truncated feed each item contains only a summary of the content the feed item links to. Someone reading the feed will need to follow the link in the feed to get the rest of the content. Conversely, a full feed contains the entire text and thus the person reading the feed doesn't need to visit the publishing site.

There's a big question over whether truncated feeds make more sense than full feeds. Some people argue that truncated feeds drive more traffic as the feed items act as teasers that require the user to follow the link back to the publisher's site. Another theory is that, while it is true that truncated feeds drive more traffic, there is a bigger picture to consider.

According to a Techdirt article from 2007, "Full text feeds makes the reading process much easier. [That] means it's that much more likely that someone reads the full piece and actually understands what's being said — which makes it much, much, much more likely that they'll then forward it on to someone else … and that generates more traffic and interest and page views from new readers ..."

If you are summarizing a podcast then the length of your text content will probably be relatively short, but how much you include in a feed item will depend on what your goals are.

Now we have great quality audio content for our podcast and we have the text that accompanies it in either full or truncated format. Next we create a real RSS feed and deploy.

Gibbs an be reached at gearhead@gibbs.com.

Keith Shaw

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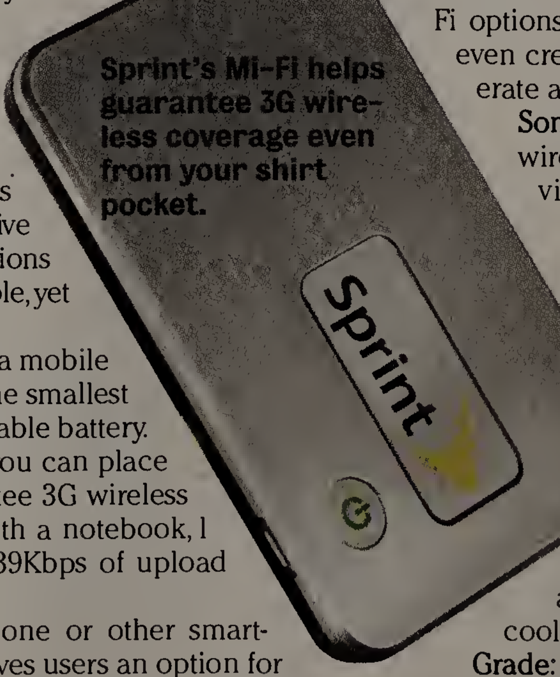

Sprint's Mi-Fi helps guarantee 3G wireless coverage even from your shirt pocket.

The scoop: Sprint Mi-Fi 2200 mobile wireless router, by Sprint (and Novatel Wireless), about $100 (after rebates, plus data service).

What it is: The Sprint Mi-Fi is a credit-card-sized device that includes a 3G wireless (Sprint's EV-DO Rev. A) connection combined with a Wi-Fi router and GPS radio. The device is powered by a rechargeable lithium-ion battery, and does not require an external power source (although it has a power cord for recharging the battery or if you want to keep it powered during use). The 3G/Wi-Fi combination lets users take advantage of 3G network access and provide Wi-Fi LAN coverage for as many as five other users. This can be advantageous in locations where Wi-Fi or other network access is unavailable, yet 3G coverage is.

Why it's cool: This isn't the first time I've seen a mobile router that provides this functionality, but it is the smallest one I've seen, and one that works off a rechargeable battery. This creates an extremely mobile device that you can place into a car or even your shirt pocket to guarantee 3G wireless coverage for your notebook PC. In my tests with a notebook, l averaged 670Kbps of download speed and 539Kbps of upload speed with the Mi-Fi device.

Mobile devices with Wi-Fi (such as an iPhone or other smartphone) make the Mi-Fi more interesting, as it gives users an option for connecting to a different 3G network than the one on their device. But before you think the Sprint 3G was faster than the AT&T 3G network on my iPhone, l averaged 1.28Mbps of download and 205Kbps of upload speed on my AT&T iPhone, vs. 428Kbps of download and 232Kbps of upload speed with the iPhone via Wi-Fi/Mi-Fi. I'd love to try the same tests with the Verizon Wireless version of the Mi-Fi (coming soon), because l live in New England, where Verizon is known for better 3G coverage/speed than Sprint's network. l was pleasantly surprised at the AT&T performance on my iPhone 3G. Configuring the device is done through the PC's browser interface, and you can create a new SSID, along with all of the security settings and Wi-Fi options that you'd get on a normal Wi-Fi router. You can even create a temporary hot spot and the system will generate a random SSID and security key.

Some caveats: The only way to determine your 3G wireless signal strength is by connecting to the router via the notebook browser. An indication (LED lights?) would have been nice to see how strong the coverage was during my tests. In addition, at times the Wi-Fi connection on the Mi-Fi would just stop if l wasn't using it (maybe there's a standby mode that shuts off the Wi-Fi?). I had to reset the device and then reconnect my mobile device to get it going again.

Bottom line: The added mobility and scenarios where the Mi-Fi can be used effectively make this an intriguing device. For groups of mobile workers or for adding additional Wi-Fi coverage in 3G-only areas, it's a cool option.

Grade: ★★★★ (out of five).

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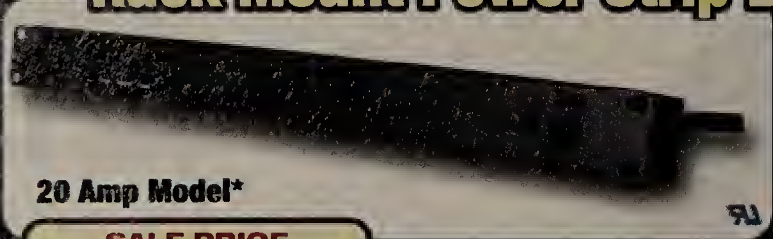

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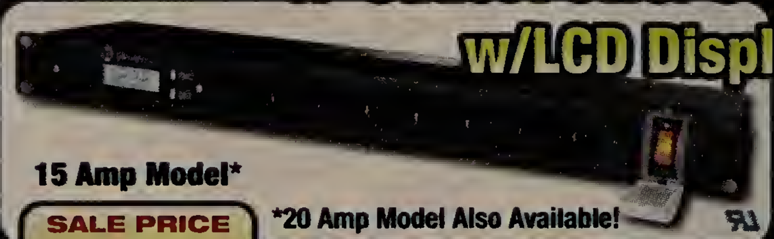

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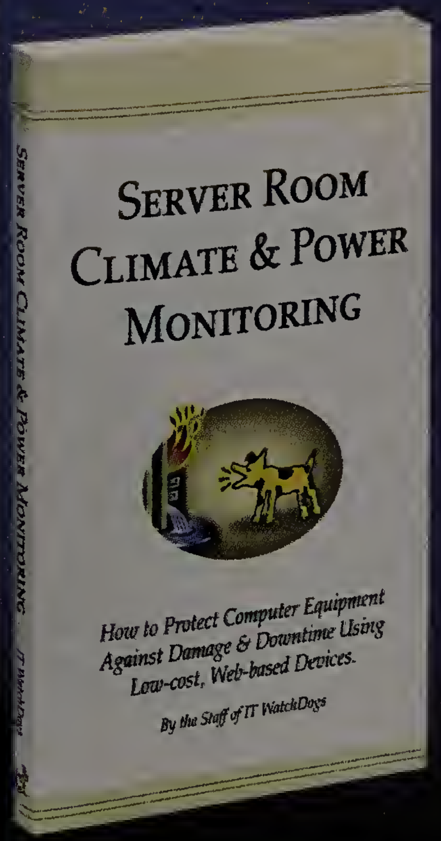
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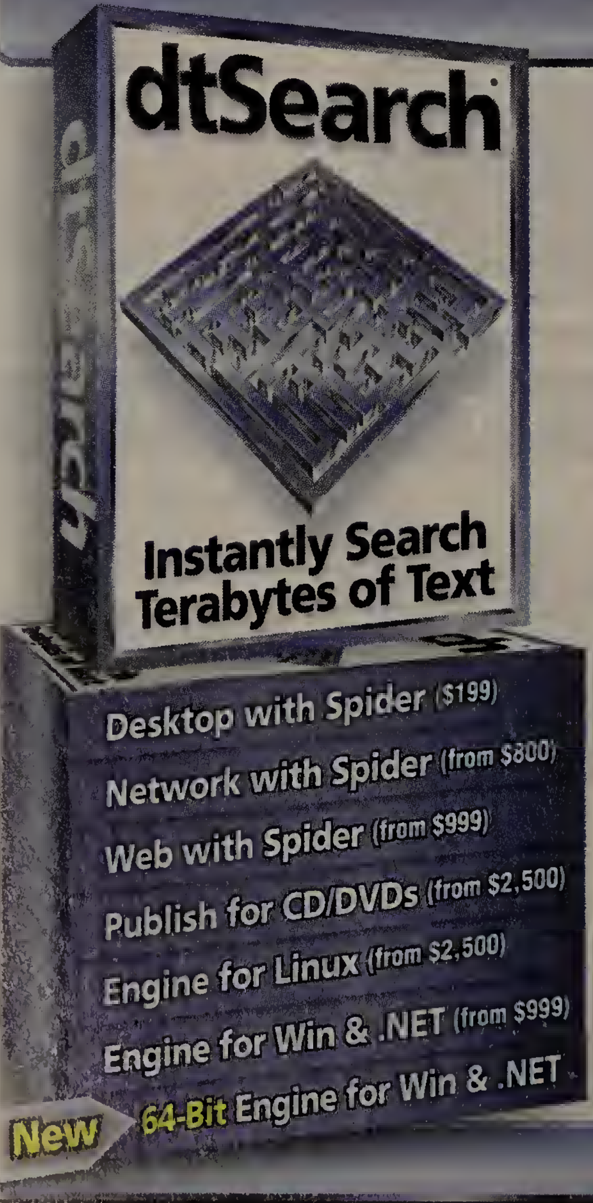
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BACKSPIN
Mark Gibbs

The Twitpocalypse Tragedy

It has been predicted that we're nearing the collapse of Twitter, the "Twitpocalypse". And to hear some commentators, it's going to be a tragedy. Accordingly, here's my tragedic play in the classical Greek style that I have titled "Twitpocalypse Now."

Act 1: Enter the chorus, consisting of 12 people holding tragedy masks in front of their faces in the style of ancient Greek dramas.

Chorus (all together): Oh, woe, woe, woe! What is to become of us? Twitter may be about to go belly up and we're stuck here on stage. We'll be missing the biggest Fail Whale to date.

Enter Euripides Trousers and Digeratus, stage left.

Euripides (boisterously): What sayest thou, Digeratus? What is the nature of this calamity that someone tweeted to me is about to befall the microblogging world?

Digeratus (seriously): Forsooth, Euripides, it is a technical issue but it may be of great moment. Maybe Twitter will fail this time. I mean really fail — none of that "Fail Whale" crap.

Act 2: Chorus (running to stage left): We are doomed! Doomed! We might not be able to tell the world what we had for lunch!

Digeratus: Here's the thing … every message (verily, they are called "tweets") handled by Twitter is given a unique number. This number is a signed 32-bit value which is variously called a word, a long, a doubleword, or a longword and the greatest signed value that can be represented in 32 bits is 2,147,483,647. Here's the thing: Twitter has become so incredibly popular that the number of tweets it has handled is nearing that maximum value. Doest thou know what happens when you add one to the maximum value that a signed doubleword can represent?

Euripides (smugly): You get zero?

Digeratus (even more smugly): No, my friend, you get -2,147,483,648! Remember the value is signed so the top bit flippeth over! And then, as if that weren't confusing enough, the value will increase with each message sent until it reaches zero whence it will wend its way back to the maximum value. Why, oh why, didn't they use an int64!

Act 3: Chorus (holding their heads): Our brains hurt. Could you shorten that to 140 characters or less?

Digeratus: The problem is whether Twitter can handle this flipping from a maximum positive value to maximum (or should that be "minimum"?) negative one? Even if it can, will Tweetdeck still work? Will Tweetr? Will Twitterific? Can any of those applications and services deal with such devilish torment? We knoweth not!

Euripides: So tell me, when exactly will this catastrophe happen?

Digeratus: According to www.twitpocalypse.com tweets are being generated at a rate of about 197 per second so they guess that the Big Neg will happen on June 13 at about 08:54:00 AM GMT.

Chorus: No! We will be lost! We might have to watch YouTube!

Digeratus: Then again, it might be like Y2K and nothing will happen.

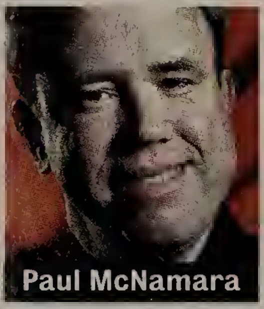
Act 4: Euripides: I'm confused. If this does actually happen will it really be a catastrophe? Will anyone lose money? Will anyone die?

Digeratus: Well, no. Not really. Mayhaps the Internet will become a void without social interaction and maybe a million people won't be able to tell each other that they have dental appointments, that they hate the rain, and that the dog threw up on the carpet, but that's about it. Or, mayhaps, nothing at all will happen as I suggested.

Chorus (crestfallen): Oh. Really? That's it? Can we go home now? "American Idol" is about to start.

Exit all, hurriedly, stage coach.

Your drama to backspin@gibbs.com.



NETBUZZ
News, Insights, oddities

Someone has to read the fine print

Next time a major Web site such as Facebook, Google or eBay changes their seldom-read terms of service, a new project from the Electronic Frontier Foundation will be there to chronicle the alterations and highlight them for all to see.

Called TOSBack, the EFF site launched recently and is already tracking 44 sites.

"Terms of service form the foundation of your relationship with social networking sites, online businesses, and other Internet communities, but most people become aware of these terms only when there's a problem," said EFF Activism and Technology Manager Tim Jones, in a press release. "We created TOSBack to help consumers monitor terms of service for the websites they use everyday, and show how the terms change over time."

Most Internet users read these agreements about as often than they peruse car owner's manuals, which is to say only when it smells like something is burning.

Yet ToS changes happen all the time, those changes are often important, and they can cause a stink, as Facebook and its faithful learned recently when the company proposed alterations to its terms that were perceived as Facebook helping itself to the pictures and writings of members. Much caterwauling and backpedaling ensued before order was restored.

The EFF project may actually accelerate such flare-ups in the future, which would be a good thing.

Some of the initial changes that have been highlighted would appear to be trivial, such as one from Facebook that notes nothing but a change in contact information (and who uses snail-mail addresses anymore?).

But others are clearly more meaningful, such as one flagged from the ToS of domain name registrar GoDaddy.com, adding the language: "You acknowledge and agree a copy of the customer contact data you provide will be used as the initial domain contact data and made public in the WHOIS database." And another from eBay that adds several paragraphs of new verbiage covering a buyer's obligations when alleging receipt of a fraudulent item.

The site's homepage includes a "highlighted policies" box, which presumably will help pull some of the nuggets from what promises to quickly become an avalanche of change notices.

It will be interesting to see if the site proves useful … or just gets tucked back into the glove compartment.

Web 2.0 crowned English's 1 millionth word

Boo! I've always hated the term Web 2.0 and wished it would go away. That's not happening, obviously, now that the Global Language Monitor — no, I had never heard of it either — has decreed that Web 2.0 is now and forever the 1 millionth "English word or phrase."

"It has crossed from technical jargon into far wider circulation in the last six months," the organization said last week.

It has also jumped the shark, given that those on the cutting edge of Internet innovation are busy arguing about its successor. Witness the ongoing dustup between the *Wall Street Journal's* Kara Swisher and blogging institution Robert Scoble over the use — or not — of Web 3.0. He's against it — "The Web does NOT have version numbers" — while she … oh, never mind, it's all too tedious for words.

Web 2.0 was not the only tech-related word to be in the running for the honor of being No. 1,000,000: Cloud computing, defriend, sexting and N00b finished among the runners-up.

How tweet got snubbed is anybody's guess.

Use any of the million you want. The address is buzz@nww.com.

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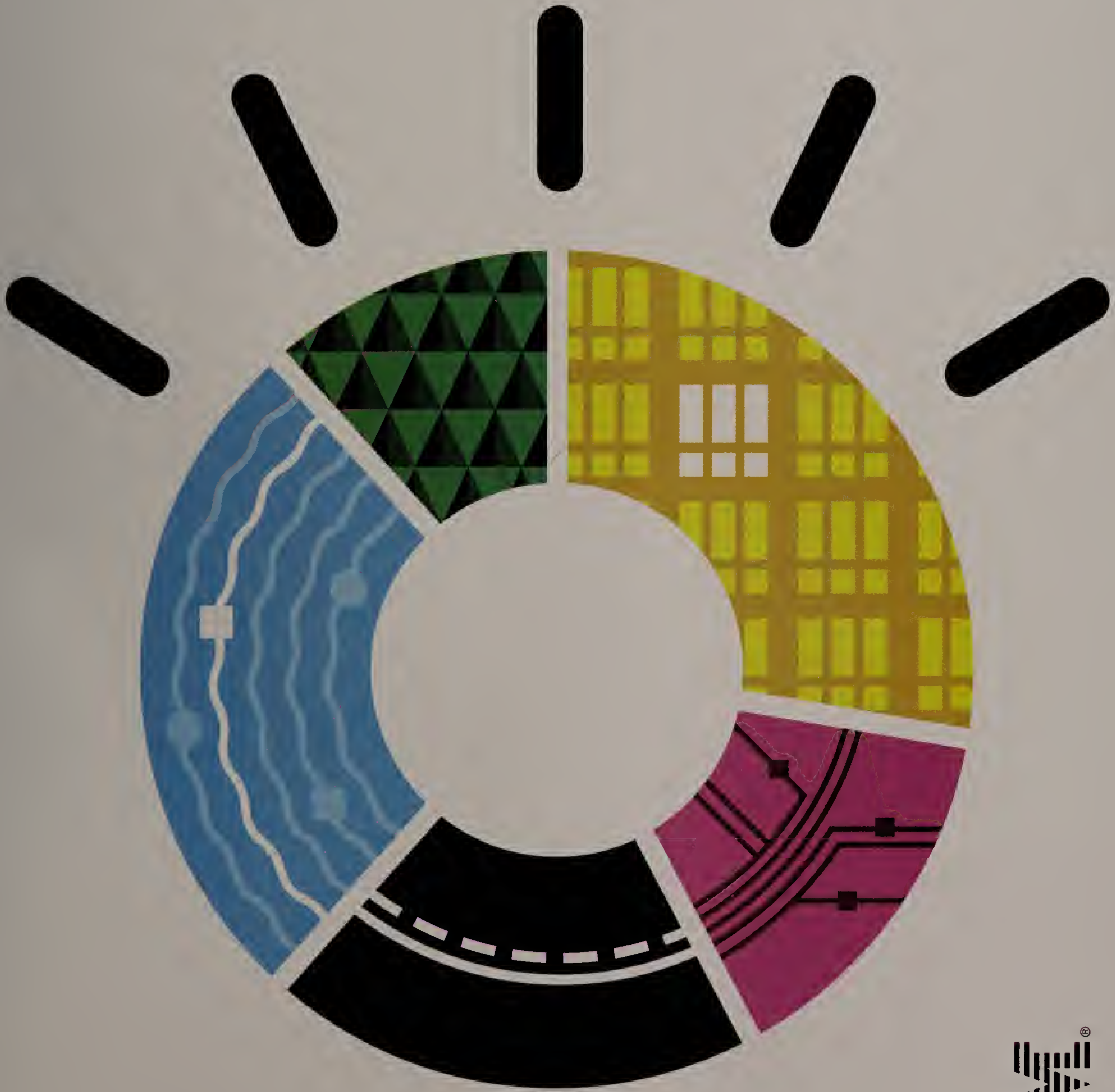

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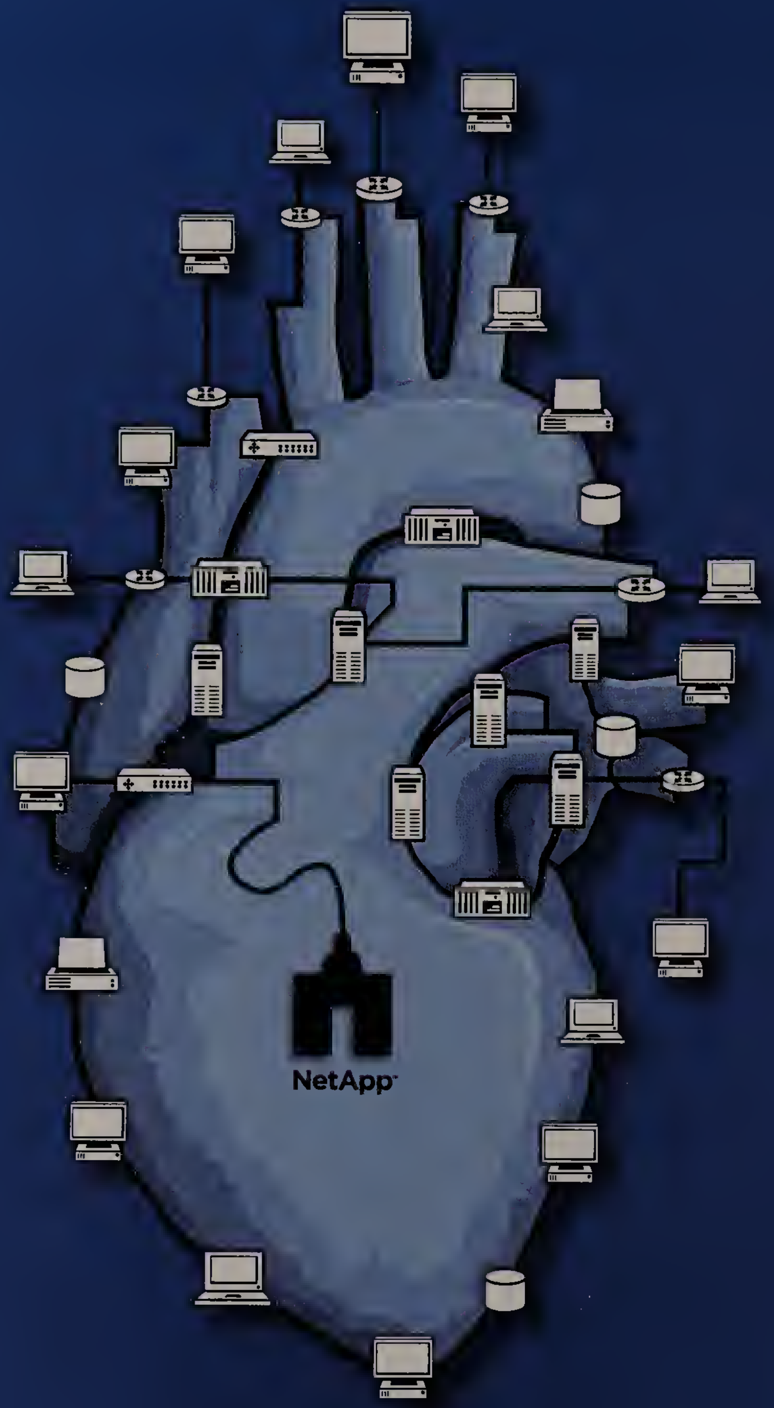

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